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THE PHILADELPHIA MEETING OF THE AMERICAN ASSOCIATION.

The Quaker City experience gained by the members of the American Gas Light Association during the occasion of their Fourteenth Annual Convention, in the third week of October last, must have been peculiarly gratifying, in that it completely proved to them (if further proof in such regard were at this late day needed) how strong the cords are which bind the gas fraternity of this country together in the bonds of fealty and friendship. And not alone in these particulars are the proofs made patent, for each successive reunion brings out in strong relief the important fact that technical progress keeps sturdy pace with the strides which lead to closer fellowship. It is pleasant to know that the purposes which animated those who founded the American Association were based on principles that bear witness to their sagacious foresight; and perhaps more pleasing still is it at the present day for them to have the conviction that they even "builded better than they knew." But as the chronicler of current events may not be granted the privilege of unduly dwelling upon that which is classed as belonging to the domain and pen of the "recorder of ancient history," it so becomes our simple duty to tell of the facts of the present; and as these relate to the doings proper of the Fourteenth Annual, we must perforce confine ourselves to them alone.

A most auspicious augury as to the spirit which moved the brethren, in regard to what was to be, was afforded by the invasion of the JOURNAL office, on early morning of October 19th, by a heavy Eastern delegation, headed by Brother Slater, of Providence, who dropped in while *en route* to Philadelphia. The signs and tokens were further strengthened by the appearance of twos and threes in the course of the day, and the last of the voyagers to make his bow in our Pine street mansion was the President-elect of the New England Association—Mr. Jno. P. Harbison. Warned by the hurrying of the hosts the JOURNAL's delegates joined the caravan, and, thanks to the Pennsylvania Railroad—giant monopoly though it be—the 90 miles betwixt the metropolis and the Quaker City were soon wiped out. Tuesday evening early the Hotel Lafayette already held a number of the visitors within its hospitable walls, and all were eager for the morrow. Wednesday morning opened fair and bright, and with the order of "on to the *foyer*" passed around, the members, who were present by that time in great force, took up their march to the rallying ground. President Wood, gavel in hand, must have experienced a thrill of pride and pleasure when his eyes calmly wandered over the assemblage which greeted his appearance behind the speaker's table. Secretary Humphreys, too, may have had at least a momentary flash of gratification at the sight afforded, a goodly share of which could be traced to his untiring labors. The feeling, however, could not long be indulged in by either of the executives, for business crowded, and they were there to despatch it promptly. It was not long before a fly managed to creep into the ointment, for with the commencement of routine work the poor acoustic nature of the assembly room made itself unpleasantly prominent. This finally became so marked that a rearrangement of the seating accommodations was effected; and although the trouble was thus ameliorated, it was far from being corrected; but the fly was a small one, anyhow.

The applications for admission to membership were unprecedentedly large, and it is somewhat doubtful if the best interests of the Association were subserved by that fact. For on the list appear the names of some men who have not always lived up to the principles which it is the duty and pleasure

of the American Gas Light Association to inculcate and foster. Not to mince matters any, it would seem as if the Association, having in the past moved along so smoothly and well minus their participation in its deliberations, could still manage to survive the absence of the executive department of the United Gas Improvement Company from its muster roll. However, the Association seems to have not thought much about their former absence, and consequently it may be inferred that it cares still less about their presence. We have all along been in conflict with the scheme of the constitution of the Association in regard to its provisional qualifications for active membership. A division of the membership into classes, like the plan adopted by the Western Association, would seem to be necessary. Sooner or later, in fact, the thing must be done, and the notice of a motion given by Mr. S. G. Stiness, to amend the constitution in this particular at the next annual meeting, will at least have the effect of precipitating a solution of the vexed question. In point of numbers, examined from that standpoint alone, the last addition to the Association's roll must be conclusive evidence of the widespread attention directed to the Society's workings and worth.

Our reference to the membership phase of the proceedings would be most incomplete did we fail to speak of the election of Prof. E. G. Love, of New York city, to Honorary Membership in the Society. The Professor may not hold views precisely similar to those held by many of the fraternity, but his honesty of purpose in the expression of opinion entitles him to the respect always accorded an opponent who speaks with candor and from unimpeachable motive.

President Wood's address is thoroughly characteristic of the man—practical and plain and positive. Without any mincing or delay he attacks those things which have long been acknowledged as the ulcers that threatened to sap the vitality of the American gas maker's position. And in language that admits of no misinterpretation he points out the remedies that will at least rob them of their harmfulness, if not permanently blot them out. The President had a perfect right to assume a positive and unflinching att tude, for if any man in this country has had a better opportunity of becoming acquainted with the sources of these evils, and knows better how to eradicate them, that man has managed to conceal himself carefully from the eye of public recognition. Those who may speak with authority are those who have lived up to what they preach; and the Superintendent-Manager of the Syracuse Gas Light Company is a striking example of that style of preacher. President Wood's verdict in the matter of patent gas processes will afford poor comfort to the sellers or owners thereof; and it is worthy of remark in this connection to note the ringing sound and hard sense of the words of his address which bear directly on the vital point. He says: "It must be conceded that the coal gas men, with their years of experience, are well able to judge of the merits of these various processes, and whether they can be used to advantage in their works. They gladly welcome any improvement in apparatus or material that will reduce the cost of manufacturing gas so as to lessen the expense of that product to their consumers." There is the secret of the thing in a nutshell, so plainly put that he who runs may read. President Wood, in referring to the subject of gas commissions, is not as positive perhaps as might be expected; but those who favor that scheme cannot find fault with his reference thereto, as he occupied a thoroughly impartial position in the premises. Space forbids any extended reference here to President Wood's admirable address, but before taking final leave of it we would direct the attention of the practical gas men not yet members of the Association to his remarks on the valuable nature of its teachings. He but voices the sentiments which we have endeavored to impress upon our readers. It is neither saying nor expecting too much when we assert th t every gas engineer in the country ought to be present at its gatherings.

The report of the Committee on the proposed Exhibition of Gas Appliances makes plain the reason why such a display was not possible; and although it is regrettable that a different conclusion could not be reached, we perhaps may be recompensed in 1887, at the Fifteenth Annual Meeting (to be held in New York city), for the project has not been abandoned.

The list of papers, as previously announced in Secretary Humphrey's official notices in our columns, was augmented by contributions from Messrs. E. Stein, of Philadelphia, Pa., and C. F. Spaulding, of Brookline Mass. And it is with extreme gratification that we can honestly say no other gathering of the American Association in convention ever listened to a more interesting, valuable, and varied series of dissertations on technical topics of importance to the American gas makers. It is not our intention at this time to enter into criticism of these; but we cannot forbear from making some reference to one or two of them. Mr. G. G. Ramsdell, of Vincennes, Ind., handled the subject of "Gas Commissions" in thorough style and from an affirmative standpoint, as was to be expected. Possibly no other single member of the Association was better equipped to give such an exposition, and we think our readers will agree with us in that view when they recall to mind the work of investigation carried on by him as Chairman of the Special Committee appointed at the instance of the Western Association in 1885, as evidenced by the report presented to that body last May at Columbus, Ohio. In due time Mr. Ramsdell's last paper will be given to our readers, but now we would deprecate the action taken at Philadelphia in regard to its findings. A motion was made that the Association put itself on record in favor of urging the establishment of gas commissions, and it would appear as though the members were somewhat afraid of the matter. Outspoken opposition is more commendable than the dodging of a question ever can be. The motion slumbers on the Secretary's table, and thus we are as far off as ever from a knowledge of where the Association stands in respect of the subject of Gas Commissions. Mr. W. W. Goodwin's "Statistics Regarding the Gas Companies of America," is a masterpiece of compilation, and how suggestive its figures are. Many of those present had exalted ideas of the magnitude of American gas industry; but we will venture to say that not one who listened to the facts, as these were unfolded, was prepared to claim that his wildest guesses went so far. *En passant*, it may be remarked that water gas does not look very formidable when it is coldly ciphered out. As before remarked the technical contributions were all of an exceptionally high grade.

The election for office bearers resulted in the selection of Mr. M. S. Greenough, of Boston, Mass., to fill the Presidential Chair; and Messrs. T. Turner, Charleston, S. C., A. B. Slater, Providence, R. I., and E. McMillin, Columbus, Ohio, were chosen to the respective seats of 1st, 2d, and 3d Vice-Presidents. Mr. C. H. Nettleton, Birmingham, Conn., was made chairman of the Finance Committee; and Mr. J. P. Harbison, Hartford, Conn., will preside over the deliberations of the Executive Committee. The selection of Mr. C. J. R. Humphreys, of Lawrence, Mass., to the positions of Secretary and Treasurer was simply inevitable. The name of Mr. Turner was greeted with an extra hearty round of applause, and we might here briefly note a word or two of what that gentleman's late earthquake experience resulted in. At the time of the terrible visitation, on the last day of August, Mr. Turner and his family were sojourning at Summerville, about 20 miles distant from Charleston, and one can imagine the anxiety that beset him. However, he at last succeeded in reaching the stricken city, and while the gas works were badly damaged, he has the satisfaction of saying that the Charleston Gas Light Company kept up the lighting of the city, but only at a great loss, as for quite a while over 60 per cent. of the sendout escaped through the fractured mains. His coal sheds were thrown down and many other important losses were entailed; but the fractured mains—the breaks occurred chiefly where the lines led off from one another—gave the most annoyance. One surprising feature is that not a single explosion of gas was reported to have taken place. Mr. Turner's recital was most interesting; and upon its conclusion, when he said they "proposed to go ahead," the speaker was greeted with a hearty round of cheers.

This brings us down to the banquet, and how shall we do justice to the gentlemen who arranged for and provided it? The elegant banqueting hall of the Union League Club never looked to better, nor to as good, advantage than on the evening of October 21st. As outlined in our last issue, something grand was to be expected; but, in truth, elegance was about outdone. The floral decorations, consisting of various pieces of gas apparatus reproduced to the life, if we might say, were marvels; and the *menu*, in its every detail and service, unapproachable. The grand scale of the affair can best be judged from the fact that 250 guests (and these included the entire membership of those in charge of the Philadelphia Gas Trust) partook of the feast. Of course, at this late date, the sparkle of the proceedings cannot be reproduced in type, and we will content ourselves by saying that the enjoyment and *bonhomie* of the occasion were freely entered upon. Mr. Wood was as clever in the banqueting hall as he was capable in the President's chair; and what greater praise can be given—for he was perfect in both. The mention would not be complete without a reference to the occupant of the toastmaster's chair, and who should he be other than Capt. White, whose tact is so well flavored with *sal Atticum* that it looks as if the Association ought to add the position of "official toastmasfer" to its list of office bearers, and oblige the "Cap." to occupy it permanently. The excursion and luncheon on the Delaware river, the inspection of the Market street works of the Gas Trust, the drive through Fairmount Park, and the luncheon at the Belmont Mansion, were all carried out precisely in accord with the mention of same that appeared in our last issue. The ladies that accompanied the party—and there were many of them, bless them—all agreed that Philadelphia, even if it were sometimes called the Quaker City, contained a most royal set of hosts. In fact that feeling so strongly pervaded them that they were moved to present a set speech of thanks to their entertainers, which was given during luncheon season at the Belmont Mansion. The irrepressible Captain, on behalf of the Committee of Arrangements, accepted the graceful act in most gallant and courtly style. With the closing in of early evening the Hotel Lafayette was reached once more, and the Quaker City gathering of '86 had terminated. No words of praise can be too strong to apply to the success of the efforts of the gentlemen who supervised the arrangements, for these were simply perfect—a perfection only attained by untiring perseverance and forethought.

[Official Report.]

Fourteenth Annual Meeting of the American Gas Light Association.

Held at the Academy of Music, Phila., Pa., Oct. 20, 21, and 22, 1886.

First Day—Morning Session—Wednesday, Oct. 20.

The foyer of the Philadelphia Academy of Music presented an animated appearance when, at 10 A.M. on Wednesday, Oct. 20, President Austin C. Wood, of Syracuse, N. Y., announced that the Fourteenth Annual Convention of the American Gas Light Association was formally commenced.

On motion of Mr. S. G. Stiness the minutes of the last annual meeting were unread, the same having been duly published in the American Gas Light Journal.

Applications for Membership.

Secretary Humphreys announced that the following-named gentlemen had applied to be received as members:

Abel, W. G., Atlanta, Ga.
Adams, H. C., Philadelphia, Pa.
Addicks, J. Edward, Phila., Pa.
Amory, Robert, Brookline, Mass.
Bartlett, E. L., Baltimore, Md.
Bodine, Samuel D., Phila., Pa.
Coffin, John A., Gloucester, Mass.
Clifford, Jas. B., Pittsburgh, Pa.
Collins, Jos. H., Jr., Phila., Pa.
Cosgrove, W. L., Evanston, Ills.
Cornelius, Robt. C., Phila., Pa.
Deering, Jno. J., New York.
Doty, Albert J., Philadelphia, Pa.
Duff, John M. M., Cornwall, Ont.
Elkins, Geo. W., Phila., Pa.
Elkins, Wm. L., Jr., Phila., Pa.
Fenell, Jos. L., Philadelphia, Pa.
Foster, T. G., Montgomery, Ala.
Gibbs, Wm. W., Phila., Pa.
Harris, J. A., Phila., Pa.
Helme, Wm. C., Phila., Pa.
Horry, Wm. Smith, Phila., Pa.
Kitson, Arthur, Phila., Pa.
Kraft, Geo. W., Jr., Phila., Pa.
Lee, E. C., Philadelphia, Pa.
Ledby, J. E., Reading, Pa.
Lowe, T. S. C., Norristown, Pa.
Pratt, E. G., N. Attleboro, Mass.
Rowland, Wm. L., Phila., Pa.
Reed, J. C., Greensburg, Pa.
Salter, James E., Phila., Pa.
Sisson, Frank N., Albany, N. Y.
Sherman, B. F., New York.
Smith, Jno. W., Phila., Pa.
Smith, Orlando F., Washington, D. C.
Spaulding, Chas. S., Brookline, Mass.
Stratton, Rodney J., Decatur, Ills.
Twining, E. H. B., Chicago, Ills.
Wagner, H. Dumont, Phila., Pa.
Waldo, C. S., Boston, Mass.
Watrous, N. S., Little Falls, N. Y.

On motion of Capt. White the Chairman appointed Messrs. Wm. Helme, S. G. Stiness, and G. S. Hookey a committee to examine and report upon the eligibility of the applicants.

Election of New Members.

The committee subsequently handed in a report in favor of the applicants, who were thereupon elected in due form.

Introducing Mr. Park.

The President—I have pleasure in introducing to you Mr. Wm. K. Park, Chief Engineer of the Philadelphia Gas Trust, and Chairman of our General Committee of Arrangements, who desires to speak a word of welcome to the members of the Association.

Mr. Park—Mr. President and Gentlemen: At the Cincinnati meeting of the Association the President appointed a Committee of Arrangements, and, having named me as its Chairman, it therefore devolves upon me to welcome you to the city of Philadelphia, and to say to you that we have made preparations for your comfort and pleasure which we trust you will find such as to cause your stay among us to be a pleasant one. Our programmes (copies of which have been furnished you), will show the outline of what it is proposed to do, and I hope the details will meet with your approval. I am not a man of words, and I welcome you to the city with all heartiness.

The Secretary read an invitation from Alfred G. Baker, Esq., President of the American Academy of Music, extending an invitation to the members of the Association, on behalf of the Wells-Mapes Illustrated Concert Company, to attend a matinee of the Company on Saturday afternoon.

On motion of Mr. E. Stein the invitation was accepted.

Roll Call.

The following members answered to their names during the progress of the roll call:

Andrew, John, Chelsea, Mass.
Archer, B. F., Camden, N. J.
Avery, A. J., Dunkirk, N. Y.
Africa, J. S., Huntington, Pa.
Atwood, H. A., Plymouth, Mass.
Baumgardner, J. H., Lancaster, Pa.
Bates, J. W., Utica, N. Y.
Battin, I., Albany, N. Y.
Baxter, Wm. H., Petersburgh, Va.
Baxter, I. C., Evansville, Ind.
Baxter, Robert, Halifax, N. S.
Beal, W. R., New York, N. Y.
Bill, Geo. D., Malden, Mass.
Boardman, A. E., Macon, Ga.
Blodget, C. W., Brooklyn, N. Y.
Borgner, Cyrus, Philadelphia, Pa.
Bredel, F., New York, N. Y.
Burtis, P. T., Mount Holly, N. J.
Bush, John S., New York, N. Y.
Butterworth, W. C., Rockford, Ill.
Cabot, Geo. D., Lawrence, Mass.
Cabot, J., New York, N. Y.
Clark, W., New Orleans, La.
Cartwright, Wm., Oswego, N. Y.
Cartwright, J., Fishkill-on-H., N. Y.
Cartwright, M., Rochester, N. Y.
Cressler, A. D., Fort Wayne, Ind.
Cole, T. W., Altoona, Pa.
Coggshall, H. F., Fitchburg, Mass.
Collins, A. P., New Britain, Conn.
Connelly, T. E., New York, N. Y.
Connelly, J. S., New York, N. Y.
Copp, A. M., Boston, Mass.
Cornell, T. C., Yonkers, N. Y.
Coyle, P., Charlestown, Mass.
Curley, T., Wilmington, Del.
Cushing, O. E., Lowell, Mass.
Daly, D. R., Jersey City, N. J.
Davis, F. J., Waltham, Mass.
Davis, F. R., Athol, Mass.
Dell, J., St. Louis, Mo.
Denniston, W. H., Pittsburgh, Pa.
Diall, M. N., Terre Haute, Ind.
Dickey, Chas. H., Baltimore, Md.
Dickey, R. R., Dayton, Ohio.
Dingee, F. A., Philadelphia, Pa.
Down, Wm. H., New York, N. Y.
Edwards, Geo. B., New York, N. Y.
Flemming, D. D., Jersey City, N. J.
Findlay, J. H, Ogdensburgh, N. Y.
Fodell, Wm. P., Philadelphia, Pa.
Fowler, J., Philadelphia, Pa.
Floyd, J. R., New York, N. Y.
Floyd, F. W., New York, N. Y.
Gates, F. W., Hamilton, Ontario.
Graeff, G. W., Jr., Philadelphia, Pa.
Gardner, Wm., Pittsburgh, Pa.
Gardner, James, Jr., Pittsburgh, Pa.
Geggie, D. H., Quebec, Canada.
Gordon, J. J., New York, N. Y.
Greenough, M. S., Boston, Mass.
Gribbell, J., New York, N. Y.
Gridley, E. B., Bloomington, Ill.
Griffin, J. J., Philadelphia, Pa.
Goodwin, W. W., Philadelphia, Pa.
Hallett, J. L., Springfield, Mass.
Hanford, L. C., Norwalk, Conn.
Harbison, J. P., Hartford, Conn.
Hayward, T. J., Baltimore, Md.
Helme, Wm., Philadelphia, Pa.
Hequembourg, C. E., Bradford, Pa.
Hoover, C. E., Winchester, Va.
Hookey, G. S., Augusta, Ga.
Hopper, T. C., Philadelphia, Pa.
Hopper, Wm. H., Philadelphia, Pa.
Humphreys, A. C., Philadelphia, Pa.
Humphreys, C. J. R., Lawrence, Mass.
Huntington, P. W., Columbus, Ohio.
Hyde, G. A., Cleveland, Ohio.
Jones, S. L., Philadelphia, Pa.
Kraft, G. W., Philadelphia, Pa.
Kreischer, G. F., New York, N. Y.
Kuehn, J. L., York, Pa.
Lane, Wm. M., Lancaster, Pa.
Lansden, T. G., Washington, D. C.
Leach, H. B., Taunton, Mass.
Learned, E. C., New Britain, Conn.
Learned, W. A., Newton, Mass.
Littlehales, T., Hamilton, Ontario.
Loomis, B., Hartford, Conn.
Lowe, L. P., Philadelphia, Pa.
Ludlam, E., Brooklyn, N. Y.
McCauley, L. G., West Chester, Pa.
Mayer, F., Baltimore, Md.
Merrick, S. V., Philadelphia, Pa.
McElroy, J. H., Pittsburgh, Pa.
McMillin, E., Columbus, Ohio.
McIlhenny, J., Philadelphia, Pa.
McDonald, Wm., Albany, N. Y.
Morris, H. G., Philadelphia, Pa.
Monks, R. J., Boston, Mass.
McDougall, J., Hornellsville, N. Y.
McCullough, E. H., Philadelphia, Pa.
Nettleton, C., New York, N. Y.
Nettleton, C. H., Birmingham, Conn.
Newell, J. W., New Brunswick, N. J.
O'Brien, Wm. J., Philadelphia, Pa.
Page, G. S., New York, N. Y.
Parkhurst, J. G., Coldwater, Mich.
Parks, W. K., Philadelphia, Pa.
Pratt, Jno. C., Boston, Mass.
Pearson, Wm. H., Toronto, Ontario.
Perry, Albert D., Quincy, Mass.
Perkins, Jas. D., New York, N. Y.
Pritchard, Chas. F., Lynn, Mass.
Prichitt, Samuel, Nashville, Tenn.
Ramsdell, Geo. G., Vincennes, Ind.
Reinmund, Henry J., Lancaster, O.
Richardson, F. S., N. Adams, Mass.
Rider, George, Norwich, N. Y.
Robinson, Wm. L., Uniontown, Pa.
Rogers, J. F., Jamaica Plain, Mass.
Rollins, J. H., Worcester, Mass.
Roots, D. T., Connersville, Ind.
Slater, A. B., Providence, R. I.
Smallwood, Jas. B., Baltimore, Md.
Stanley, Ira N., Brooklyn, N. Y.
Spaulding, C. F., Brookline, Mass.
Smedberg, Jas. R., Baltimore, Md.
Stannard, A. B., Phila., Pa.
Stedman, Wm. A., Newport, R. I.
Stein, E., Philadelphia, Pa.
Sherman, F. C., New Haven, Conn.
Smith, Marcus, Wilkes-Barre, Pa.
Simpkin, Wm., Richmond, Va.
Stiness, Sam'l G., Pawtucket, R. I.
Taber, R. B., New Bedford, Mass.
Tayler, Geo. H., Warren, Ohio.
Thomas, Jos. R., New York, N. Y.
Thompson, James D., St. Louis, Mo.
Townsend, S. S., New York, N. Y.
Turner, Thos., Charleston, S. C.
Vanderpool, Eugene, Newark, N. J.
Watson, Chas., Camden, N. J.
Weber, Oscar B., New York, N. Y.
Williams, James, Johnstown, Pa.
White, Wm. Henry, New York, N. Y.
Wood, Austin C., Syracuse, N. Y.
Wood, Gideon, New Bedford, Mass.
Young, Robert, Allegheny, Pa.
Young, John, Pittsburgh, Pa.

PRESIDENT'S ADDRESS.

President A. C. Wood then read the following annual address:

Gentlemen of the American Gas Light Association:

We are again assembled in annual meeting for the purpose of conferring together as to the best modes of improving, extending, and conducting our business—not only for our own benefit, but for the benefit of the communities we serve. And in serving our respective communities to the best of our ability we greatly improve and strengthen our own condition; for, as between the gas consumer, the city or town authorities, and the gas companies, there exists a mutual interest that should be worked together for each

other's good. But we hear complaints from some gas companies that their city or town authorities are antagonistical to their companies' interests; and, again, from the same or other companies, we learn that the newspapers of their towns are always against them in their operations.

Let us candidly look at this, and satisfy ourselves as to the cause of the seemingly irreconcilable differences between those who are neighbors, and who should be on the most friendly terms. It is not to be denied that there exists in the communities a sort of universal prejudice against corporations; and gas light companies receive the full benefit of that prejudice. But are the communities to be held altogether responsible for a continuation or augmentation of these prejudices? Are not the gas light companies themselves largely responsible for such a condition of public sentiment? The very nature of our business, in that it consists in economically supplying a town or city with gas, is of necessity a monopoly; and the operations of a gas company should be so conducted as to cause this monopoly to be as little oppressive as possible. This can be done in a measure by giving your consumers a good quality of gas and plenty of it, at a reasonable price, or one consistent with paying fair dividends to your stockholders; encourage the use of gas for purposes other than lighting; extend mains into non-paying districts; avoid all disputes and contentions with your consumers and city authorities; always meet them with a conciliatory spirit—remembering that "It is better to give than to receive." By doing all these things you will greatly popularize and strengthen your company with your citizens and the press; and this policy will also tend to disabuse the public mind of prejudices, and greatly fortify your company against opposition.

All of the gas companies of the country are therefore interested in conducting business not solely on their own account, but for its effect on the business generally; for wherever you see a gas company conducting its business in an arbitrary and unjust manner, charging an exorbitant price for gas of low candle power, paying large dividends to its stockholders, and refusing to extend its mains into districts not already built up, there you will find that that gas company is in bad repute with the citizens and press of the town where it operates. Not only so, but the ill repute of such companies spreads abroad, to be used as an argument against other gas companies; and even those who have pursued an opposite policy in the conduct of their business suffer in consequence. Indeed, a large measure of the prejudice existing to-day against the gas companies of the country has grown out of the short-sighted and illiberal policy of the managers of gas light companies of former days—a policy still adhered to by those who may yet be classed in the list of unprogressive companies.

Cases illustrative of this position will perhaps make my meaning more clear.

While crossing one of the New York city ferries a few weeks ago, and having taken a seat in one of the cabins of the boat, I found myself located beside an old gentleman, whose venerable locks and placid and intelligent countenance would indicate their possessor to be a shrewd and thorough business man of the old school. From his appearance, together with the nature of the conversation that went on with the neighbor seated on his other side, I judged he had been successful in his life-long business pursuits, and had now retired to a neighboring town to spend his remaining days in well-earned comfort. His only drawback to a perfect peace and happiness seemed to be that he was president of the local gas company. I am not given to eavesdropping, but from my forced position, and as soon as the words, "gas company," were spoken between the two, I felt an immediate interest. Our venerable friend complained that his townsmen would not patronize the gas company; that his neighbors and friends, and even the directors and stockholders of his company were not using gas, but supplying themselves with light in other ways. All were "down on his company;" the only newspaper in the town was continually crying out against this unjust monopoly; the business was rapidly declining, and had not paid a dividend in several years. They had expended no money in extending or improving the works—in fact the stockholders had been called upon, from year to year, to take money out of their pockets to make up a deficiency in current expenses—and as our friend held most of the stock he was discouraged and ready to retire from the gas business. The facts were that he lived in a growing suburban town, and was trying to supply its citizens with gas from a works built many years before, without any subsequent enlargements or improvements in the plant or extension of the mains having been made. He gave them an inadequate supply of inferior gas, and charged a prohibitory price for it, but yet he complained of the unfriendliness and hostility of his neighbors and the press.

This picture is not overdrawn, as it is painted from facts; and it will apply to many of the small gas companies of the country to-day. Another case in a city containing over 100,000 inhabitants, where the gas company had pursued a like narrow policy in its management—no extensions, no improved modern appliances in the works, charging $1 more per thousand for 16-candle gas than should have been charged for a 20-candle gas, according to the locality and its conditions, dividing thirty or more per cent. in regular dividends with an occasional extra—inevitably tended to array the citizens, the city authorities, and the newspapers in antagonism to the company, so that when a second or competing company asked for a franchise it was readily granted by the Council.

The citizens, failing to secure the promised relief from the unjust demands of the old company in granting a franchise to the new, in consequence of a division of territory and an agreement between the two companies to charge the old price for gas and to continue the business in the old way, were still more greatly prejudiced against "the gas monopoly," and ready to be again bitten by the same dog. The Council, backed up by the citizens, gave a franchise to a third company, whose organizers promised to wipe out all the existing evils. This third company soon absorbed the other two; and now, with more than three times the required capital, it is supplying the city with gas of the same quality and kind and at the price charged by the two older companies.

This is but a repetition of the history of the gas business in the larger, and many of the smaller, cities of the country, where we find from two to eight gas light companies doing business in localities where one company could better, and at a less price, supply all the gas required by the consumers.

It is not to be contended that a conservative or arbitrary management of the business has alone caused or admitted of the multiplicity of gas companies in the several localities where the multiplication exists. Undoubtedly there were other causes, which we will treat of hereafter, that also contributed toward bringing about this state of things. But we do contend that that kind of management has tended to create, sustain, and intensify the prejudices existing in the community against gas companies, and that those prejudices have largely assisted the projects of opposition companies in obtaining their franchises; and we further claim that a more conciliatory and accommodating spirit in our dealings with the public would have largely helped to protect ourselves against opposition, and have aided in removing existing prejudices. In satisfying the public you gain their favor, and, having the people with you, you can generally defy competition.

Other influences, aside from public opinion, which have made it possible for the projectors of opposition gas companies to obtain franchises and enter into competition or compromise with existing companies, are: The existing laws in the several States; unjust and corrupt legislative and municipal authorities; and speculation at the hands of unprincipled men.

In many of the States the laws are such that a certain number of men can associate themselves together and form a gas light company. After filing their articles of incorporation with the Secretary of State and County Clerk, they apply to the city authorities for a franchise. If this is obtained the projectors are then in position to demand a bonus from, or compromise with, the old company. Failing in that they proceed to build a gas works of moderate capacity, lay a few miles of main in the business center of the district, expending but a small portion of the capital in stock and bonds issued, and enter into competition with the old company. Finally, a settlement is effected which results in an increased investment of capital, and consequently an increased price for gas—in the face of prices made, and despite the bonds (which are always evaded) given to the contrary. The streets of the city are torn up and left in a damaged condition, and no benefits are derived in any direction. This is the inevitable result. It has been repeated in every city where tried, and is being repeated to-day wherever the speculators can obtain a foothold.

After the repeated experiences of such unsatisfactory, in fact disastrous, results from establishing opposition gas companies in various cities of the country, it may well be asked, "How is it these men continue on in their operations, and are successful in obtaining the privileges they ask for?" I would answer—

First: The established gas companies are not always in condition to wage a contest with an opposition company, and for reasons already set forth in this address.

Second: These designing men, who usually have patent rights to sell, are unscrupulous in their demands. They advance false claims as to their ability to manufacture and sell a better and cheaper gas than that hitherto furnished. They corrupt common councils through "buying up local zealous defenders of the new company with promises of stock or bonds, or both, for services rendered in roping others into the schemes." In short, the men engaged in such enterprises are adventurers who travel from city to city making money for themselves by threatening existing companies with competition in an effort to compel the latter to purchase worthless patents. They bring no money with them, but manage to carry it away in large amounts.

These adventurers also receive great encouragement in their operations from manufacturers and dealers in materials and supplies who furnish their goods and labor, receiving in payment therefor stock or bonds that are freely issued on behalf of the bogus enterprise—the stock or bonds being taken at a large discount from par value. At the same time the old company is or has been buying like kinds of goods from these same manufacturers, but has paid in cash for all such purchases. Thus cash is put into the pockets of

the manufacturers, which enables them to carry the bonds of the bogus company, an equivalent to putting capital into the hands of the latter, and aiding it to carry on an unequal fight against the old company.

Manifestly that is unfair dealing, and should not be. If the manufacturer sells his goods for cash to the opposition, we have no cause to complain. It is this unfair discrimination that we complain of.

A degree of encouragement has also been given these operators by some of the gas companies whose managers have purchased some particular patent, thinking thereby to strengthen themselves against others and against opposition. Let me say to all such that no safeguard against these pretenders is secured by so doing. If you buy of one it only encourages others to make a similar raid upon you, which, sooner or later, they will attempt. Several cases of this kind have come under my personal observation.

The way to meet these raiders is:

First; put yourselves right in your own community; popularize your company in all legitimate ways; then, when the time of trial arrives, you are ready for the fight. At that time inform yourself of your opponents, and their operations in other places; give this information to your citizens and the city government through the press. Tell them also of the result of establishing opposition gas companies in other cities, and you can assert without fear of successful contradiction, that the establishment of a second or more gas companies in the same city has never resulted in a permanent reduction in the price of gas to either city or citizens.

Second; the establishment of a second or more gas companies in the same city has always resulted in an increased price for gas to both city and citizens.

Third; the projectors of a second or more gas companies in the same city never complied with the terms of the contract made with the city as to the price of gas, care of the streets, and other important conditions.

Fourth; that no money, or other consideration, by way of damage, was ever recovered by any city on the bond given by the projectors of a new gas company in consequence of a forfeiture of contract.

For many years those engaged in the gas business have, from time to time, had their attention called to various *patent processes* for making gas from coal, oil, wood, peat, and other substances, including the most prominent of all—the so-called water gas. Claims have been set up that gas made under these various processes was cheaper and better than that made from coal. These claims *have not been substantiated in any particular*, and are only speculative.

The making of water gas, or "the decomposition of water by means of incandescent carbon, was accomplished in 1793; and since then much time, energy, money, and intelligence have been devoted to the problem of making water gas economically as compared with gas from bituminous coal."

A complete list of the different patented gas processes—mostly for water gas—patented in this and foreign countries would fill a volume. And, too, history repeats itself in these water gas processes, inasmuch as many of those that are prominent at the present day are but a fac-simile in apparatus and maniptulation of those patented and used over 60 years ago.

Since that time these processes have increased in numbers, and repeat themselves, from year to year, over and over again to a surprising degree. Some of these so-called "new" processes have been tried in one locality, or perhaps in some foreign country, to be brought out in this country, or some other locality; but they are "new" in name only.

To substantiate this position we find printed in "Hughes' Treatise on Gas Works," published in 1863, and reiterated in subsequent editions down to the year 1885, and also mentioned by M. Gillard, as early as the year 1849, this description of making and using water gas:

"Hydrogen gas was employed by M. Gillard in another manner. In this instance the gas issued from an Argand burner surmounted by a platinum wire cage which reached a little above the dull hydrogen flame. The wire cage became incandescent, and a cylinder of intense light was formed around it over the whole surface, the light being obtained simply by the incandescence of the platinum wire. Two or three small towns in France were lighted for some time by these means, but the great expense of hydrogen caused it to be renounced. The light by this process, although intense, was neither agreeable nor useful. With the view of obtaining hydrogen more economically, M. Gillard erected a cupola similar to those in iron foundries; this was filled with coke or charcoal, ignited, and the fuel brought to a state of incandescence by a fan or blower; after which (all passage to or from the atmosphere being closed) steam was admitted at the lower part, and passing through the volume of fuel, was decomposed, when the hydrogen and carbonic acid with which it was impregnated were withdrawn by an exhauster from the upper part of the cupola. From time to time the supply of steam ceased, and air was furnished by the blower, as before, to bring the fuel to the proper degree of temperature for the decomposition.

"This plan, although much more economical than the retort system, did not succeed. The expense of manufacture was still very excessive. Therefore it may be concluded that the production of hydrogen gas by the decomposition of water is neither advantageous nor economical; and, whether applied by being intermixed with rich gases, or heated platinum wire, cannot compete with coal gas."

This Association, at its annual meetings, by means of papers read and discussed, and by the efforts of committees of investigation, and also of the individual members, has from time to time examined into the merits of these so called new processes for making gas. As for myself, I have given them a very great deal of attention, and have never been able to obtain any reliable information, gained by observation or inquiry, that goes to show in them any advantage over coal gas, either as to cost of production, quality of gas, or in any other particular.

It is perhaps true that in localities where the cost of material is favorable, water or oil gas can be made and put into the holder at less expense than coal gas; but in those cases the difference is but a few cents per thousand cubic feet, and when the other conditions are considered you will always find the advantage to be with coal gas.

There are about 1,080 gas light companies in the United States and Canada; and of this number 153 are set down, in a recent published list, as water gas plants. The total number includes small and isolated plants erected for lighting factories, mills, summer residences, and hotels, as well as those erected as auxiliaries to established coal gas works, and exclusive plants for lighting towns, cities and districts.

During the past twenty or more years the projectors of various water gas schemes have been indefatigable in their exertions to induce the established companies to adopt their processes, and either by force or through threats of competition, demands for large sums of money, or by purchase, they have only succeeded in establishing this small number of plants.

When a man or company of men projects and establishes an enterprise that is for the accommodation and benefit of the public, they are to be commended and encouraged in such an undertaking. But I will defy the projectors of any water gas scheme to prove that, in a single instance, their operations have been for the public good, or for the benefit of the gas consumer. Therefore it is not surprising that so few of the gas companies of the country have been induced to take hold of these schemes; and, in fact, the only wonder is that the numbers mentioned above have allowed themselves to be inveigled or forced into it.

The projectors of the various patent processes, who have no interest save getting the largest possible amount of money out of their enterprise, say that the coal gas men are conservative and prejudiced against their processes.

We are conservative in our own interest, and to guard against imposition; and when we see these schemes brought forward, and one after another of them utterly fails to show any advantage over the results we are already obtaining from coal, we are forced to be conservative. And when these men come to us and demand a bonus of many thousands of dollars for their patents, which are of no use to us, we are bound to resist them to the bitter end.

It must be conceded that the coal gas men, with their years of experience, are well able to judge of the merits of these various processes, and whether they can be used to advantage in their works. They gladly welcome any improvement in apparatus or material that will reduce the cost of manufacturing gas, so as to lessen the expense of that product to their consumers. It is a matter of business interest for us to do this, and we are laboring to that end. Many improvements in the art of manufacturing coal gas have been made during the past years, and like or greater advances will continue to be made in years to come.

A much mooted question of to-day is the establishing of State Gas Commissions, for the regulation of gas companies, their protection against raiders, and also in the interests of public policy as well. Such a commission has already been established in the State of Massachusetts, and, although perhaps not as complete as might be, yet it is, I believe, working out very beneficial results in that State.

Several of the local associations of gas men have taken action looking to an investigation of this subject. Among other matters of record on this question I would commend to your especial notice the majority and minority reports of the Special Committee of the Western Gas Association, appointed to consider and report upon the advisability of urging the appointment of State Gas Commissions upon the attention of the Legislatures of the several States represented in that Association. The reports, presenting both sides of the question, are very complete, and, together with the discussion that followed their reading, are of interest. You will find them published in the issues of the American Gas Light Journal dated July 2d and 16, 1886. The Western, as well as other kindred Associations except our own, is local in its organization and membership. The American Association being an international as well as an interstate organization, since its membership list includes the names of many members of the various kindred bodies, besides those who are not members of any of the local Associations, and also bears witness to the fellowship of our Canadian brethren, it is therefore eminently

proper that any action toward the establishing of State Gas Commissions should emanate from this Association. I recommend the subject to your careful consideration.

We have reason to congratulate ourselves upon the progress our Association has made and the great good it has accomplished during the fourteen years of its existence. At the first or preliminary meeting, held in the city of New York, on April 16, 1873, there were present 36 representatives from 24 different gas light companies, located in 14 different States. Representatives were there from Massachusetts in the East, California in the West, Michigan on the North, and Georgia and Florida in the South. That representation proved to those present that the desire and need for such an Association were not confined to any one locality. At that meeting it was resolved to perfect the organization and invite *all* of the gas light companies of the country to join in the enterprise.

From this small beginning we have grown to our present membership of nearly 300. Yet these 300 members only represent about 200 of over 1,000 gas light companies in the United States and the Provinces. How is it that 80 per cent. of the gas light companies of the country have not yet seen fit to cause their representatives to join our Association? Is it from the fact that these delinquent companies, having read our proceedings as officially published in the American Gas Light Journal, believe that they thus secure to themselves the full benefits of our Association without the trouble of attending our meetings? Or is it on account of the expense incurred for membership and traveling expenses—as is actually the case with one of the brightest members of our Association, who occupies the responsible position of Treasurer of his company, as well as Superintendent of the works? He writes: "I am in doubt about going to Philadelphia, for our board of directors decline to pay the expense; and they pay me so small a salary that I cannot afford to go on at my own expense." Or perhaps it is that among these 800 companies outside of our Association there are some who are so fully educated in the gas business that they have nothing to learn and nothing to impart to their fellows. I know of a few such, and they have my pity.

I would say to the boards of directors of all the gas light companies who have not sent their representatives to join our Association, and also to those who are already members, but who feel disinclined to incur the expense of sending their representatives to our meetings, you cannot better invest a small amount of money—an investment that will bring surer or larger returns—than to invest it in this direction.

The benefits to be derived from this Association are not confined alone to the regular proceedings as they are found published in the American Gas Light Journal, but are largely derived from the social intercourse of the members with each other. In these private conversations points are brought out, information is gained, obstructions and perplexities are removed that are not and cannot be reached by the regular order of our proceedings.

It may be claimed by these delinquent companies that there are local Associations to which they send their representatives. This is true; but, as a rule, they, as well as our own Association, meet but once a year and at different seasons of the year, and I am thoroughly convinced it would be greatly to the advantage of the gas light companies of the country if their managers could hold local meetings for consultation every month in the year—as is done by the Guild of Gas Managers of New England and the Society of Gas Lighting of New York—and then come together at the annual meetings of the American Gas Light Association, where we could have the benefit of the combined wisdom of the gas men of the whole country, fortified and strengthened with the knowledge gained at the local meetings.

The great advances made during the past few years in manufacturing gas, in improving its quality, and in reducing the price at which it is now sold to consumers, are largely to be attributed to the friendly rivalries which have grown out of the holding of these meetings, and the occasion of social comparison between the members, one with another, which our sesssions afford. Every gas light company in the country, however large or small, can receive benefits from these Associations if their managers will avail themselves of their opportunities.

And now a word to the members. There seems to be a lack of interest, or perhaps rather a sort of diffidence among the members in the matter of preparing papers for and joining in the discussions at our annual meetings. In the early days of the Association members volunteered to write and present papers, but now the disinclination to do so is such as to cause our Secretary a great amount of labor in writing and personal interview in order to secure "papers to be read." Owing to his indefatigable industry and persistent effort we have had no lack of papers up to the present time; but in order to relieve the Secretary from an unpleasant and laborious duty I would recommend that, either by resolution or an amendment to our by-laws, the executive committee be empowered to annually select from the members a certain number whose duty it shall be to write and present papers for our consideration at the next following annual meeting. It is most desirable that every member shall at all times feel at liberty to express himself or relate his experience in matters under discussion. There lives no manager of a gas works, however small, but who in his experience has learned something of importance that is of value to his fellow gas man. And it is this knowledge gained by experience that we want brought out at our meetings. Some of the most valuable knowledge I have ever gained has been obtained from the manager of quite a small works; and the size of the works over which a man has charge should not be thought of in connection with his presenting a paper or taking part in our discussions. Let us all take a part in this good work, and all will be the gainers thereby.

At our last annual meeting it was "Resolved, that this Association hold an exhibition of gas appliances at the city of Philadelphia in October next," and a committee was appointed to carry into effect the intent of that resolution, as well as to arrange for subsequent action thereon. A committee to arrange for the present meeting was also appointed at that time, and thus two committees were created. When it was found that it would be necessary for these two committees to frequently confer together, in order that their action should harmonize I decided that they should act as one committee. The efforts to arrange for an exhibition having failed (for reasons that will be given you by those who had the matter in charge), this joint committee acted as a committee of arrangements, and devoted all of their energy in arranging for the comfort and enjoyment of the members of the Association during their sojourn in Philadelphia.

Our Secretary has been called upon to record the death of two of our members during the past year, in the persons of Mr. James Dwight Brewer, of Springfield, Mass., and Mr. John Anderson, of Ironton, Ohio. The task of preparing fitting memorials to their memory should be intrusted to those of our number who knew them well.

In conclusion, I desire to express my acknowledgment for the distinguished honor you have conferred upon me, to say that I have confidence to believe that I can safely rely upon your assistance in the discharge of the duties before me, and to indulge in the hope that this, the Fourteenth Annual Meeting of our Association, will be as eminently successful as were its predecessors.

Committee on President's Address.

Mr. McMillin moved that the address be referred to a committee of three (to be appointed by the Secretary) for consideration and report.

The motion was agreed to, and the Secretary appointed, as such committee, Messrs. E. McMillin, A. B. Slater, and Thos. Turner.

Report of Special Committee on Proposed Exhibition of Gas Appliances.

The Secretary read the following report from the above-named special committee.

Mr. President and Gentlemen:—It is with regret that the Committee on proposed Exhibition of Gas Appliances have to report their failure to arrange what was looked forward to with so much interest at the time of our gathering in Cincinnati last year.

Upon their return to Philadelphia they immediately took up the question of the exhibition with the Franklin Institute—which Association had for the past two years given to the public exhibitions that were very attractive as well as instructive—as it was understood by the Committee that it was intended to have the display in connection with that organization.

It was hoped the results obtained by the Institute from their former exhibitions would encourage them to hold a third one this fall; and as October was the month in which their displays had been held we believed that a proper and comprehensive display of gas appliances would be not only interesting to the members of our Association during their stay in the city, but, further, that such an exhibit, and the proper grouping of the various new gas appliances—such as burners, stoves, heaters, heating apparatus, gas engines, etc.—could be so presented that the public would see what it was possible to do with gas. That knowledge would encourage the day consumption of gas (an object so earnestly desired by all those engaged in the business of its manufacture) and aid in abolishing the old-fashioned idea, entertained by so many gas consumers, that gas can only be satisfactorily and practicably employed as an illuminating agent.

The results of this exhibition, had it been held, would have been widely diffused over the United States, for it has been the custom of the Franklin Institute, after the close of the exhibitions, to make experiments and tests, and publish the results thereof, regarding the appliances that were displayed. These reports could not fail to have yielded much information, and, coming from an authoritative source, would have carried great weight. The Franklin Institute undoubtedly pays close attention to such details, and its official examiners conduct their investigations scientifically and with minuteness.

It was, therefore, as said before, with great regret that we learned from the managers of the Institute that the exhibitions were to be discontinued. Had we determined to proceed alone in the matter of collecting material and arranging for its display we would not only run the risk of placing the

Association under heavy expense, but also, on account of the limited nature of the exhibits, the display would fail to elicit public attention, and would suffer in not having that official indorsement which would be gained were the Franklin Institute interested with us in the work. Again, had the Committee undertaken to collect apparatus simply for the inspection of the members of the Association only, they feared it would result in a very meager display, and subject the members to harassing solicitation by the agents who had machinery to sell. That would have so far broken into the pleasure and profit of the gathering that it was concluded best to relieve the Association from any chance of meeting with such an incubus.

If in the future, however, the Franklin Institute resumes its former plan of holding exhibitions, we feel that it could not but result in great good to our Association did we join in the display and cause gas appliances to be a marked and prominent feature of the exhibition. With the passage of time the uses to which gas may be applied become more numerous, and with that increased importance so will the proposed exhibitions have greater value and interest.

We would, therefore, in presenting our report, respectfully suggest that the Association arrange for the possibility of such an occasion in the future, by placing the matter in the hands of some one clothed with permanent authority to bring it up at the proper time.

PHILA., PA., Oct. 7, 1886. WALTER WOOD, Chairman.

Mr. Helme, speaking for the Institute, said: I wish to inform the Association that the proposition was duly considered by the Franklin Institute Board, and that a serious effort was made to see a way clear to give an exhibition this fall. We found there were many difficulties which could not be overcome. One of the principal obstacles was this. The ground on which the building stood belonged to the Pennsylvania Railroad Company, and its use was granted the Institute with a stipulation that it should be vacated in less than a year. When the Electrical Exhibition (1884) had been held we prevailed upon the Pennsylvania folks to let us keep it for another year, and then the "Novelties" Exhibition (1885) was held. The railroad company, needing the ground, would not consent to an extension of our lease, and the former Institute Exhibition hall is now being torn down. I mention this as one of the reasons why the usual exhibition was not held this fall by the Franklin Institute; and because I do not wish the Association to receive an impression that the Institute did not consider their proposition. In fact, they were highly gratified that you had made the proposition.

Mr. Stiness—I move that the report be received and placed on file, and that the thanks of the Association be tendered to the committee. Agreed to.

After Mr. W. W. Goodwin, from the Committee of Arrangements, had outlined the preparations made for the entertainment of the visitors, the President called for the reports of Standing Committees, etc.

REPORT OF EXECUTIVE COMMITTEE.

PHILADELPHIA, PA., Oct. 19, 1886.

To the Members of the American Gas Light Association:—Gentlemen—Your Executive Committee would respectfully report the following acts and recommendations for your adoption:

That the times for holding the meetings of the Association during the convention be as follows: Wednesday, meet at 10 o'clock A.M., adjourn at 12:30; reconvene at 2 P.M., adjourn at 6 P.M. Thursday, same hours. The following papers have been approved:

"Gas Commissions," by George G. Ramsdell, of Vincennes, Ind.

"A New Departure in Gasholder Houses," by Captain William Henry White, of New York.

"Three-Hour Charges," by A. B. Slater, of Providence, R. I.

"Condensation," by Robt. B. Taber, of New Bedford, Mass.

"Statistics Regarding the Gas Companies of America," by Wm. W. Goodwin, of Philadelphia, Pa.

"Suggestions upon Candle Power and Illumination," by A. E. Boardman, of Macon, Georgia.

"Some Further Remarks upon Natural Gas," by W. H. Denniston, of Pittsburgh, Pa.

"The Hydraulic Main," by Fred. W. Floyd, of New York City.

"Some Suggestions upon Paper Writing," by James H. Armington, of Brooklyn, N. Y.

"Flue Construction of Benches," by I. N. Stanley, of Brooklyn, N. Y.

Recommended that the Secretary be instructed to proceed with the publication of Volume VII. of the Association's Proceedings.

Recommended that Prof. E. G. Love, of New York city, be elected an Honorary Member of the Association.

On motion of Capt. White the report was received and its recommendations adopted.

REPORT OF TREASURER AND SECRETARY.

The Treasurer and Secretary, Mr. C. J. R. Humphreys, presented the following report for the year ending September 30, 1886:

Receipts.

Initiation fees	$250 00	
Dues for year 1883	5 00	
" " 1884	35 00	
" " 1885	115 00	
" " 1886	940 00	
" " 1887	5 00	
Sale of "Proceedings"	1 00	
Interest on the funds of the Association	70 43	
Total receipts	$1,421 43	
Cash brought forward from last year	1,863 59	
Total amount to debit		$3,285 02

Expenditures.

Printing	$187 60	
Salary of Secretary and Treasurer	500 00	
Expenses of Cincinnati meeting	249 30	
Postage, stationery, and petty cash	145 53	
Total expenditures	$1,082 43	
Cash on hand carried to credit of next year	2,202 59	
Total amount to credit		$3,285 02

Memo. of cash on hand:

Deposit in South Brooklyn Savings Bank	$1,156 26
" Williamsburgh Savings Bank	774 34
" Lawrence Savings Bank	200 00
Cash in Treasurer's hands	71 99
Total as above	$2,202 59
Due from members, including dues for 1887	1,865 00

The roll call for the year shows as follows:

Honorary Members.

Number on roll Oct. 1, 1885	6
Number admitted October, 1885	1
Number on roll Oct. 1, 1886	7

Active Members.

Number on the roll Oct. 1, 1885	269	
Number admitted at meeting of 1885	25	
Making		294
Number dropped from roll during the year	7	
" died	2	
" resigned	4	
" on roll Oct. 1, 1886	281	
Making, as above		294

Deceased Members.—James D. Brewer, of Springfield, Mass., and John Anderson, of Ironton, Ohio.

On motion of Mr. Nettleton the report was received and ordered to be spread upon the minutes.

REPORT OF FINANCE COMMITTEE.

PHILADELPHIA, PA., Oct. 19, 1886.

To the Members of the American Gas Light Association:—Gentlemen—Your Finance Committee would respectfully report that they have examined the books and accounts of the Treasurer and Secretary, C. J. R. Humphreys, for the year ending Sept. 30, 1886, and find the same to be correct.

Very respectfully,

WM. CARTWRIGHT, CHAS. H. NETTLETON, } Finance Committee.

On motion of Capt. White the report was received and ordered to be spread upon the minutes.

NOMINATING COMMITTEE.

On motion of Mr. Stedman a committee of five, to prepare a list of nominations for offices for the ensuing year, was named in the persons of Messrs. W. A. Stedman, G. G. Ramsdell, F. W. Gates, A. E. Boardman, and J. R. Thomas. The committee was instructed to report back after first recess.

TO NAME PLACE FOR HOLDING NEXT ANNUAL MEETING.

On motion of Capt. White the President named Messrs. W. H. White, W. C. Butterworth, John McDougall, John Andrew, and Marcus Smith as a committee to name place for holding next annual meeting.

This brought the initial routine business to a close.

(To be continued.)

Tar as Fuel.

[A paper read by Mr. T. Bower, of West Hartlepool (England), at the late meeting of the North of England Gas Managers' Association. Reprinted from the London *Journal of Gas Lighting*.]

In bringing before you to-day the question of "Tar as Fuel," for the purpose of heating retorts, I do so more with a view to stating my own experience and to elicit that of others in this direction than to lay before you any novelty. Indeed, as you know, the use of tar in retort furnaces is the revival of a very old system, dating back almost from the introduction of gas lighting; and it is only since the sudden collapse in the price of tar for manufacturing purposes that it has again come to the front as a fuel. Its qualities for this purpose having been so ably set forth by Mr. N. H. Humphrys, F.C.S., and other talented writers, in addition to the many explanatory letters and papers by those managers who have given us the benefit of their experience through the columns of the several gas publications, it is unnecessary for me to dwell upon this aspect of the question; and I shall, therefore, briefly state my own experience.

The retorts for which I have used tar as fuel are in settings of sevens, 9 ft. 3 in. long, 21 in. by 15 in. oval. On the top of the bench is placed a wrought iron cistern, with strainers fixed both at the inlet and outlet, into which the tar is pumped from the tar well. The tar runs out some 6 inches above the bottom of the cistern through a 1¼-inch wrought iron pipe, reduced to ¼ inch, which passes on to the burner. Running alongside of this pipe is a ¼-inch steam pipe, reduced to ⅛-inch, which also passes on to the burner. The furnaces are such as are used for coke, with the doors pushed back, and the front filled in with 9-inch brickwork, with an opening at the top about 3 inches square, through which to pass the burner. There is another aperture near the bottom, 9 in. by 6 in., and in this is placed a cast iron frame with plug, into which is drilled four ¾-inch holes for the admission of air. This opening also serves for the purpose of clinkering; as, by the removal of the plug, any deposit which is formed in the furnace can easily be removed. The ashpan is entirely filled up with ashes. The furnace doors and frames are left in position; so that, should it be desired, a change can at any time be made from the use of tar to coke in a very few minutes, without any interruption of work, by simply pulling out the brick front.

My first trial was with a burner similar almost in construction to the one described by Mr. Smith, in the *Journal of Gas Lighting*, for Feb. 16th last, with the exception that a T-piece with plug was used instead of an elbow to facilitate cleaning. This is a burner that may be made by any ordinary gas fitter. We regulated the flow of tar to the burner by means of a ¼-inch cock, placed for convenience some 4 or 5 feet from the burner. We had however very great difficulty in getting a continuous flow for the quantity we required; the cock frequently becoming completely stopped up. This annoyance became so great that it led us to abandon its use altogether, and allow the tar to flow the full bore of the pipe till it reached the burner. The one described was taken out, and one of our own construction (the same as that now before you) was fixed. It consists of a piece of wrought iron pipe, 11 inches long, with two 1¼-inch by ¼-inch T-pieces—one for steam, and the other for tar—making its entire length 16 inches. Inside this is an inner tube, ¾-inch diameter, and 1 inch shorter than the outer one; and passing through the center of this is a ¼-inch iron spindle, terminating in a conical-shaped plug, fitting the outlet of the ¼-inch pipe—the plug being worked from the outer end by an ordinary stuffing-box screw, such as is used for water stops. The space for an inch at the end between the outside of the ¼-inch pipe and the inside of the 1¼-inch pipe is filled in with a malleable iron ring ¼-inch thick, through which are made four perforations, forming a steam-jet. In the plug which controls the supply of tar is a slit, V-shape, of such a size as to pass any quantity of tar that may be found necessary; the object of the screw attached to the plug being to open it in case of the stopping up of the slit, which can be done without interfering with the burner at all, further than one or two turns of the screw by the man in charge. As previously stated, the tar passes on from the tank to the burner (which is inserted in the opening at the top of the furnace) the full bore of the ¼-inch pipe; and, being forced by pressure through the slit in the plug, is immediately picked up by the steam-jet, and thrown in fine spray into the furnace. We find this burner works exceedingly well; and for weeks together it requires little or no attention. The average quantity of tar used per ton of coal carbonized for the first few weeks was 31½ gallons; but this quantity has since been somewhat reduced, and is now about 29½ gallons per ton of coal carbonized—or, in other words, 7½ gallons of tar are equal to 1 cwt. of coke; and with this quantity a very good heat can be maintained.

I have also used one of Smith's patent atomizers (made by Messrs. Goddard & Massey) with much success. And although I am not able to give you the exact quantity of tar used by this burner, I think it may be taken at about 34 gallons per ton of coal carbonized, or 8½ gallons of tar for every hundred weight of coke.

I next turned my attention to the use of tar without steam; but regret to say that with this method I have not been at all fortunate. The tar in this case ran, as before, from a tank on the top of the bench through a ¼-inch pipe, terminating with a cap, in which was drilled a hole $\frac{1}{16}$-inch diameter. Through this aperture the tar passed, dropping on to an inclined plane formed of a fireclay tile the width of the furnace, and built in with brickwork. A groove, 2 inch by 1½ inch, was cut in this tile, in which the tar ran until it came in contact with the flame inside the furnace. Openings for the admission of air were left in the brickwork somewhat similar to those described in the last case. The quantity of tar consumed per ton of coal carbonized with this arrangement was 25 gallons. The heat in the beds, however, was not at all satisfactory; and the retorts gradually went back until we were not able to burn off more than 60 per cent. of their ordinary charges. I made several trials with this method; first using a larger quantity of tar, and admitting more air, and then less, as I thought was required. All, however, ended in similarly unsatisfactory results; till ultimately I abandoned the system altogether. It might, I think, be made to answer better in smaller settings of, say, fives, or, better still, threes.

When the letters by Mr. George Livesey were published, containing the suggestion that gas companies should burn 30 per cent. of the tar they produced, with a view to increasing the price of the remainder, I myself was not very sanguine that any substantial relief would be obtained by so doing; seeing that so much tar was thrown into the market from other sources, from which it would scarcely be reasonable to expect any restriction in quantity, and, secondly, that the increased supply of coke placed upon the market would have the effect of bringing down the price of this residual generally. In some places this has, I believe, been the effect. I am, however, of opinion that there are many companies and corporations who at the present moment receive very low prices for their tar, but who could dispose, at good prices, of considerably more coke than they now produce, without any fear whatever of bringing these prices down. I consider these are the works that ought to consume not only 30 per cent. of their tar, but all of it, other than that which they have a local demand for in small quantities at fairly remunerative prices.

From particulars I have received from various gas works in our own immediate neighborhood (most of the managers of which are members of this association), I find that, taking as the basis of calculation the results I have given as my own experience, there are many to whom it would be a considerable saving to consume the whole of their tar, and dispose of the coke now used in their furnaces. For instance, there are ten companies whose average yearly make of gas is each about 24 million cubic feet; the price realized for coke 11s. 8d. per ton; and the price of tar 5s. 3d. per 100 gallons. Now all these companies could have disposed of 20 per cent. more coke without affecting their present prices. By the use of 150 gallons of tar, at a cost of 7s. 10½d., in place of one ton of coke, a margin of 3s. 1½d. per ton would be left. From this amount must, however, be deducted the cost of supplying steam, and the pumping of tar to the cistern (which will necessarily vary very much according to circumstances at each works), say, 6½d. per ton, which would leave a net gain of 3s. 3d. per ton for the extra coke to be sold. There are ten other companies, whose yearly make of gas is each equal to about 300 million cubic feet; the average price of coke, 7s. 2d. per ton; and tar, 4s. 2d. per 100 gallons. The saving in these cases, after making allowance for cost of steam, etc., would be equal to about 4½d. per ton. Eight of the works could have disposed of 20 per cent. more coke; one is doubtful; and the other could not have sold any more at the price now charged. On the other hand, there are ten works whose average yearly make is each equal to about 48 million cubic feet; the average price of coke 5s. 7d. per ton; and tar sells at 8s. 2d. per 100 gallons. To burn tar in these cases would entail a loss of more than 6s. per ton for the extra coke they would have for sale; many now finding their coke a drug on the market, even at the present low prices.

From this information it will be seen that there is much scope for tar to be used as fuel without affecting the existing value of coke. If the first ten works mentioned burned all their tar, and the second ten, say, 50 per cent., leaving the last ten to sell all they produced, the effect would be to limit the quantity to be disposed of to the tar distillers by the 30 works to something like 60 per cent. of their total production—a system which, if universally adopted, would surely tend to increase the value of this residual, and would be a boon to distillers, who, I understand, would be glad to see the market rid of some of its surplus tar.

The use of tar as fuel has also the advantage of being so readily adopted, and as readily abandoned if not required. The principal question to be decided (and each case must be treated upon its own merits) is whether it is more profitable to sell or burn tar at the prices obtained for coke and tar respectively in the immediate neighborhood of the works—a conclusion that may soon be arrived at from the particulars I have given, and the information published in the *Journal of Gas Lighting*, and elsewhere by managers who have so willingly afforded us the benefit of their experience.

In conclusion, I take this opportunity of thanking the many gentlemen

who furnished me with information, which has enabled me to lay before you these particulars; and I trust we may have a discussion on the subject which will be beneficial to all of us.

Bending Wrought Iron Gas or Steam Pipes.

The *American Engineer* points out that it oftentimes happens that such a job as bending a wrought iron pipe finds itself in hands that have never had such an operation to perform, and even with many accustomed, more or less, to such work, failure and fracture frequently surprise them, caused either from want of care or careful attention to such elements as are essential to positive success.

It stands to reason that to bend an iron pipe in its ordinary condition and preserve its shape, either hot or cold, is an impossibility in ordinary work. The strains in the metal produced in the act of bending directly tend to flatten the pipe at the bend, because there is nothing to resist the absolute necessity of the strains setting themselves into straight lines as soon as the metal at the point strained will allow it. The same tendency is at once observed in bending a solid iron rod, but not to so noticeable a degree, especially if the metal be extra good. This is because the solid metal beneath the outside metal resists that tendency of the line of strain to straighten itself out in order to act in a direct line.

Now, in order to keep the hollow pipe in shape while under the bending strain, it is necessary then to help it to assume as near the conditions of a solid rod as possible, and this may be done by filling the pipe to be bent with dry sand, lightly tapping the sand as it is filled in with a small hammer, to ensure compactness. The ends must now be plugged—best with wooden plugs.

This being done, the pipe may be put into the fire and heated very slowly, to prevent burning as well as to impart heat to the sand.

The color of the heat must not be carried quite to a white heat, and at this temperature the pipe will bend very easily, and care must be taken that the curves are regular, if regularity is required for any particular purpose. Should any portion of the curve show a tendency to bend too much a few drops of cold water dropped upon it will check it.

By care in this operation very pretty bends can be secured without danger of pinching the pipe, but should the pipe break in the operation the cause may be found in either that it was too cold, or that the metal had been burned, or that it had a flaw in it. But it may be added that some pipe will not bend.

The job can be at once finished by knocking the sand out.

It takes almost less time to make a good bend than to tell the story, and in most of such simple but necessary operations care and attention are great factors in clean and successful handiwork.

SPECIAL ENGLISH CORRESPONDENCE.

COMMUNICATED BY NORTON H. HUMPHRYS.

SALISBURY, Sept. 17, 1886.

Two New Books.—Gas Lights the Mersey Tunnel.—Gas for Mechanical Purposes.—A Good Gas Consumer.—Gas Cooking on the Large Scale.—A Strange Dispute.

Two little books having special claims upon the attention of gas engineers have just been published. I refer to the "Gas Engineer's Chemical Manual," by J. Alfred Wanklyn, and to "Devices for Gas Illuminations," by Thos. Newbigging. I read Prof. Wanklyn's book with great interest, having always held that a gas engineer should know how to ascertain the percentage of carbonic acid, sulphuretted hydrogen, etc., present in his gas, and to analyse purifying materials, ammoniacal liquor, etc. Having now had some years experience, in my own practice, of the benefits derived by knowledge of this kind, I still maintain that, although not indispensable to efficient gas engineering, anyone unqualified in this respect is working under a disadvantage, as being in the dark to some extent. While not prepared to indorse all the views expressed by Prof. Wanklyn (some of them are remarkable for originality), I gladly acknowledge that the utterances of that gentleman carry great weight, as coming from a high authority on all chemical matters. I do not think that the methods and apparatus described in the book are the best and most reliable for everyday use in gas works; but the apparatus is simple and cheap, and may well find a place in the gas works laboratory; and everyone anxious to advance in knowledge of this kind should not only read the book, but follow through with the actual performance of the tests as described. I say this from personal experience, having taken this course so far as a very limited leisure would allow, and found great advantage from using the Wanklyn 0.1 c. ft. bottle side by side with Hempel's bulbs, Bunte's burettes, and other modern experimental apparatus.

Turning to Mr. Newbigging's book, I should explain that it is issued in anticipation of the celebration of an important national event—the jubilee year of the reign of our beloved Sovereign Lady, Queen Victoria—and that therefore nearly all the devices illustrated are of a national and patriotic character. The book is quite an *edition de luxe*, being printed on toned paper with ornamental border, etc., and resplendent in Russian leather binding and gilt edges. The contents comprise particulars as to cost of gas consumed and the proper size of service pipes for the devices, and many useful hints of this nature. Amateur pyrotechnists will be delighted with the recipes for colored fires, and I can personally vouch for the excellence of some of these. The main feature of the work is some 40 pages of illustrations, constituting working drawings from which enlargements can be prepared for the use of the fitter who is to make up the device. The work is an entirely re-arranged edition of a small section on this subject included in Newbigging's "Gas Manager's Handbook."

According to a paper recently read before the Institution of Civil Engineers, by Mr. F. Fox, M.I.C.E., it would appear that gas has successfully competed with electricity for the lighting of the Mersey tunnel. This is a very important engineering work just completed at Liverpool, for the purpose of affording railway traffic and conveying passengers from one side of the river Mersey to the other. It includes gradients on each side, descending to a depth of some 100 feet or so below ground level, in order to clear the bottom of the river—the whole extending some three miles in length, of which more than two miles are tunneled. At the stations at each side there are large hydraulic lifts for raising the passengers to ground level; and it is estimated that a passenger can enter the lift on one side, descend, get into the train, be conveyed through the tunnel, get out and ascend to ground level on the other side, in the space of six minutes. In referring to the lighting arrangements Mr. Fox says: "Some surprise has been expressed at the non-adoption of electric light for the platform and signals. The author is, however, of opinion that, so long as the smallest uncertainty exists as regards the regularity of electric light, a railway company is not justified in employing electricity as a lighting agent, unless gas is laid on, so as to be readily available in case of break down of the electric lighting machinery. Tenders were, however, invited both for gas and electric lighting. It was found that, allowing an equivalent in each case, and excluding arc lights, which for many reasons are objectionable in an underground railway, the first cost of installing electric light would have been five times that of gas, and that the annual cost would have been three times that of gas. It was therefore decided to adopt gas lighting, and this has been effectually carried out by Messrs. W. Sugg & Co. A 4-inch gas main was laid through the tunnel and connected at Liverpool with the mains of the Liverpool Gas Company, and at Birkenhead direct with the gasholder of the Birkenhead Corporation. Ample pressure for lighting the lower part of the tunnel has been obtained, whilst any waste of gas from the high pressure is effectually prevented by the automatic governors fixed inside each burner."

Having occasion, a day or two since, to visit the office of Messrs. Britton & Gilson, 180 Union St., Southwark, London, I found in the works of that firm a most interesting example of the use of gas for technical purposes. The index hands of a very large meter at the entrance of their premises were pursuing their circular course at a rate of speed that would excite the warmest admiration in the heart of the manager of the South Metropolitan Gas Company (who supply the gas), and the same feeling, rather tinged with envy, however, in any other gas engineer. Passing inside, I was received by Mr. W. J. Bower, a gentleman connected with the firm (it will be remembered that Mr. Bower read a paper on the application of gas to baker's ovens, at the 1884 meeting of the Gas Institute), who kindly explained the various kinds of gas-heated kilns in use in connection with the production of artistic stained glass designs for windows, porcelain tiles, the various kinds of bent and curved glass, etc. For the most part the kilns consist of shallow chambers, and in the larger size a low table or truck on wheels is provided to run in the articles to be treated. Rows of large-sized atmospheric burners are so arranged that the flames play upon the walls or roof of the kiln, according to the required purpose, and raise it to the temperature desired. It is needless to enlarge upon the advantage of gas in securing with certainty any desired temperature in connection with the art of glass and pottery burning. The manner in which glass can be curved to any pattern is very interesting. The kiln having been worked up to a very bright heat, the workman, already provided with flat pieces of glass, cut to proper shape, places a piece of glass upon a mould, raises the door, which consists of a fireclay tile bound with iron, and furnished with counterbalance weights, introduces the mould and glass by means of a sort of large spatula, and puts down the door. By the time he has prepared a second mould and sheet of glass the first sheet has softened with the heat and sunk down into the curved mould and is completed, so that the man can follow on without cessation. In the joining rooms where the pieces of stained glass are joined by means of strip lead, a gas-heated soldering iron of light and elegant construction was in use. The handle is hollow to receive the gas pipe, and a small atmospheric burner, so constructed as not to "strike back" however low it may be turned down,

running up one side of the stem, heats the bit at the top. So the workman lights the burner, and proceeds to solder without intermission, attaining just the heat he wants to a nicety, and maintaining it constantly. There is no running backwards and forwards to a stove, or having the bit too hot or too cold.

Mr. Bower also took me to a new building at Kensington, the Royal College of Music, where one of his gas-heated baker's ovens had just been erected, and here an interesting set of gas cooking apparatus on the large scale was to be seen. It is intended to provide for some 250 persons; and it is gratifying to see that the creature comforts of the young ladies who will use this college when it is opened have been so well cared for. The kitchen, in accordance with modern custom, is situated on the top floor of the building, and the apparatus comprises the Bower's oven, substantially built of brickwork, 7 ft. × 7 ft. × 15 inches inside measurement, where all the bread for the establishment is to be baked; a large gas roasting oven, by Messrs. Giles & Co., also an extensive hot plate, provided with a large number of different sized burners for boiling, etc. The Bower's oven can be raised to the usual bread baking temperature (700° F.) in one hour and a half, with a consumption of less than 500 cubic feet of gas; so, when the saving of labor, and the extra quality of the baking is taken into consideration, it is evident that any baker, who can get gas for 80 cents per thousand cubic feet or less, might adopt the Bower oven with great advantage.

A strange dispute has arisen between the two big London gas companies. The premises of a certain large railway station come chiefly in the district of the Gas Light and Coke Company, but at one extremity touch upon that of the South Metropolitan, and the former has hitherto supplied the gas. But the railway company has found that the South Metropolitan offer certain advantages in the way of discount to large consumers, and has, therefore, moved the meters to the South Metropolitan part and demanded a supply from that company. Rumor has it that the Gas Light and Coke Company intend to proceed against the South Metropolitan for supplying gas in their district. The general custom has been that so long as the meter by which the gas is measured is situated within bounds, the place where the actual consumption takes place is no concern of the suppliers. Numerous instances could be cited of large consumers situated at the outskirts of "cheap gas" districts taking special proceedings, in the way of buying little patches of land, etc., in order to get a place for a meter within the legal distance of the cheap supply mains. Certainly, the locality of the meter forms a clear and indisputable line of demarcation between neighboring but not neighborly gas companies. If it turns out that the place where the gas is actually consumed is the proper consideration, a great deal of awkwardness and ambiguity will arise in towns supplied by more than one gas company. A person living just on the border line of the district might be under the awkward predicament of having the front part of his house lighted by one company, and the back by another. At any rate, it would be difficult for him to know which undertaking he ought to patronize. This is just the sort of case that should be arranged by the application of the "give and take" system.

Tar burning continues to attract a great deal of attention in gas circles, papers and discussions upon it having formed part of the business of no less than three association meetings within the last month. So long as gas engineers confine themselves to the best methods of burning tar, and to comparisons between the practical results of coke and tar firing, these discussions are all right and proper; but when they endeavor to prognosticate the result of such a procedure on the tar market, or to discuss the "policy" of burning tar from points other than the plain question of pounds, shillings and pence, they get rather beyond their depth, and are apt to degenerate into useless random talking. The policy of tar burning must depend upon local circumstances only. If a dollar's worth of tar will save more than a dollar's worth of coke, calculated out at current rates, then it pays to burn the tar. Anything in the way of concerted action on the part of gas companies looks bad to outsiders, and may be upset at any moment by the action of blast furnace and coke oven owners who also produce large quantities of tar.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

Something that Occupied Mr. Somerville's Attention During the Summer Season.—Mr. Jas. Somerville, who devotes his energies to keeping the plant of the Indianapolis (Ind.) Gas Light and Coke Company in proper and efficient shape, has busied himself during the past summer in preparing for the winter's work. The most important feature of the task was that of doubling the capacity of his exhausting and condensing apparatus and the result was secured to his entire satisfaction. A hot tar condenser was erected, and a new Root exhauster, with engine on same bed-plate, with bye-pass and connections complete, was put in. The exhauster is rated to pass one million cubic feet per diem, and of it Mr. Somerville says: "This exhauster, I am pleased to say, runs with a remarkably steady gauge. The oscillation is reduced to a minimum." A new air condenser was also installed, and another specimen of the Pelouze and Audouin tar separator was added to the plant. Mr. Somerville asserts that the P. & A. machine takes out every particle of tar from the gas, and thus allows the ammoniacal liquor scrubber to perform most effective work in the removal of the ammonia. Mr. Somerville is still engaged in working up the liquor into sulphate, and finds a ready sale for all of that material produced in his works. The outlook for a large output of gas in Indianapolis during the coming winter is of the most flattering sort, and Mr. Somerville has every reason to be satisfied.

No More Water Gas for Appleton, Wis.—On September 20th the water gas system was abandoned at Appleton, and the change was made for the simple reason that coal gas was undoubtedly better and cheaper. Water gas was originally tried in the Appleton district about four years ago, but the proprietors of the Company do not seem to have grown wealthy from the experiment. When Mr. Wm. B. Miller assumed, last March, the duties of Secretary and Superintendent of the Appleton Gas Company his first move was to show the stockholders that water gas would be a good thing—to get rid of. With a ready sale for coke at the price of ten cents per bushel, and tar in equally good demand at the remunerative figure of four dollars per barrel, Mr. Miller was plentifully supplied with good arguments in support of his ideas, and he carried the day. The main system has been thoroughly overhauled, and the charge on the score of unaccounted-for-gas is now returned at less than 9 per cent. The Appleton folks intend to remodel their plant next season, the contemplation being to erect a new retort house to contain benches of fives, a new exhauster, holder, etc. That "long line of places making water gas" has been warranted "not to shrink," but the strands thereof have been rotting out rather quickly of late.

Something from Austin, Texas.—Some time since the city authorities of Austin made a contract with the Austin Gas Light and Coal Company under the terms of which the latter was authorized to maintain 100 or more street lamps at a charge of $2.50 per lamp per month. All lamps over lines of gas mains were to be supplied with gas, and lamps not on such lines were to be of the gasoline pattern. At present the Austin Company lights 77 gas and 30 gasoline lamps under the agreement, which is to run for two years. The Capital Gas Light Company, same place, is also lighting 47 street lamps for the city. The local electric lighting corporation has hitherto confined itself exclusively to the Brush arc system; but its managers have recently determined to go into the incandescent branch also. The company has been in existence for perhaps three years, and has met with very little encouragement. The promoters have been unable to secure any favor from the authorities, who are satisfied with the way in which gas has answered the city's requirements. Mr. A. E. Judge still acts as Secretary and Superintendent of the Austin Gas Company, and is as energetic as ever.

Election of Directors, Municipal Gas Company, Albany, N. Y.—A meeting of the stockholders of the Municipal Company was held on Saturday, Oct. 23d, at which gathering the following Board of Directors was chosen: E. C. Benedict and Roswell P. Flower, of New York city; and A. N. Brady, Robt. C. Pruyn, J. Howard King, Wm. McEwan, and John E. McElroy, of Albany. At the subsequent meeting of the directors for organization, A. N. Brady was chosen President; Robt. C. Pruyn, Vice-President; and Jno. E. McElroy, Secretary. It is expected that the new water gas plant, now in course of erection, and spoken of by us a month or so ago, will be ready for operation at an early day next month.

A Line or Two from Springfield, Mass.—Brother J. L. Hallett, who has performed such yeoman's work in connection with his superintendency of the Springfield Gas Light Company, has been true to his past reputation during the sunny days—despite the fact that these were sometimes "pretty hot"—of last summer. Now that his handiwork may be reckoned up we find that something over two miles of pipe have been added to the Company's mains, and that a general overhauling has taken place. The Springfield Company also operates a steam heating plant, and three new 100-horse power steel boilers have been added thereto. A substantial brick boiler house, 65 feet by 70 feet, is being erected, and when it is finished all the boilers—representing a total of 1,000-horse power—will be placed therein. As near as we can make it out, in the last twelvemonth the Company used up 3,000 tons of anthracite coal, together with the surplus coke product (about 100,000 bushels) of the gas department, in the generation of steam. It would be very interesting reading if Mr. Hallett could be prevailed upon to furnish some figures from the Company's books in regard to the practical results gained in the operation of that steam supply plant. A first-rate article of coal gas pure and simple is sent out at Springfield, and less than $2 per thousand cubic feet is charged for it. As Springfield is an inland city, and separated from the coal fields by a matter of 800 miles, the showing is a good one. We might also remark that Springfield was about one of the first of the New England cities to take hold of the electric light; but nevertheless

the annual output of the gas company keeps increasing in most gratifying ratio, the figures for the present year being little short of surprising.

THE GREENFIELD (MASS.) GAS MEN AT WORK.—Mr. Jas. Porter, Superintendent of the Greenfield Gas Company, has reason to be pleased with the appearance of the work recently completed under his supervision, to say nothing of the relief which it must have given him to know that he is now in position to meet whatever demands the consumers will honor him with in the coming busy season. A new station meter, exhauster, purifying boxes, etc., have been installed, and Mr. Porter is ready and anxious for the fray with darkness.

MR. SLATER SCORES A VICTORY.—About 18 months ago Mr. Slater, of Providence, R. I., was obliged to confess to defeat in that the local electricians succeeded in wresting from the Providence Gas Company the right to light the Post Office. An outfit of incandescent lamps succeeded the gas burners, and at first the novelty of the plan was accepted by some as testimony to its superiority over the former gas illumination. Reduced to the necessity, when the novelty wore off, of standing on its merit as an illuminator, defects were not slow in being developed; and finally the post office people "owned up" that gas after all was better than the light of the future. So, on date of October 1st, Mr. Slater was authorized to once more illuminate Uncle Sam's repository of the correspondence of the town "founded many years ago" by staid and clever Roger Williams. The contract is to run for a year from October 1st, 1886. Mr. Slater has availed himself of the high power burners of the Siemens-Lungren Company, and those who have witnessed the illumination of the post office lobby, as at present carried out, are enthusiastic in its praise. We believe a total of eight Lungren lamps does that portion of the lighting work. Of the lamps, one is rated to consume 16 cubic feet per hour; two take up 12 feet; and five are rated at 8 feet each. The electric company is under contract with the city to supply 125 arc street lights, to burn all night and every night, for the sum of 50 cents each per night; and the city's contract with the gas company obliges the latter to supply 2,800 lanterns with gas, the lamp burners to pass 5 cubic feet per hour, in accordance with a specified moon table, and to receive in payment therefor the sum of $1.50 per thousand cubic feet of gas consumed. Providence is a thoroughly lighted city, as to its streets.

MRS. PARTINGTON ONCE AGAIN TO THE FORE.—The New Haven *News* is our authority for the following: "Yes," observed Mrs. P., "we kinder got tired of gas, and now we're going to have the house lit with clandestine electric lights." The old lady is evidently bent on keeping up with the spirit of the age, even if she does mangle her expressions.

CHEAPER GAS FOR PERU, IND.—On October 11 Mr. A. D. Cressler, President of the Peru American Gas Company, announced that all gas furnished consumers from date of October 1 would be charged for in accordance with the following net schedule:

A monthly consumption of between	500	and	2,000	cu. ft.,	$1.95	per M.
" " "	2,000	"	5,000	"	1.90	"
" " "	5,000	"	10,000	"	1.85	"
" " "	10,000	"	15,000	"	1.80	"
" " "	15,000	"	25,000	"	1.70	"
" " of over	25,000	cu. ft.			1.60	"

Where the meter fails to show a registration of 100 cubic feet per month a charge of 25 cents will be made for meter rent. The gross rate of $2 per thousand will be charged if accounts are not settled within ten days from date of presentation. This is a good and businesslike move on the part of the new managers of the Peru Company, who have already recovered much of the ground lost by their predecessors. In fact, the obloquy which attached to the latter really made the matter appear somewhat hazardous when it was originally proposed that the American Gas Company should take charge of Peru's gas supply.

A SLASHING CUT IN RATES.—A letter from Mr. F. D. Kingsbury, Treasurer of the Corning (N. Y.) Gas Company, and dated October 22, says: "On the first of November we reduce our price for gas from $3 to $2 per thousand cubic feet." Well; that looks like business; and the move is sure to make business.

MR. T. G. LANSDEN GOES TO WASHINGTON, D. C.—Mr. T. G. Lansden, who has been in charge of the old St. Louis (Mo.) Gas Company's manufacturing plant since February, 1877, severed that relation on date of Oct. 25. The celebrated "deal" which resulted in the formation of the St. Louis Gas Trust put matters in such shape that Mr. Lansden concluded to seek more congenial company; and it is to be distinctly understood that no pressure was brought to bear upon him. The resignation was a purely voluntary act. He takes a position in the service of the Washington (D. C.) Gas Light Company with the rank of Superintendent, Mr. McIlhenny still continuing on as Engineer and President. We congratulate Mr. Lansden on his new appointment, for, while it will be far removed from a sinecure's berth, it will nevertheless afford him an excellent field wherein to display his ability. On Nov. 1st the Washington appointment took effect. When Mr. Lansden originally took charge of the St. Louis plant the annual output from the works figured out at 250 million cubic feet, and the total for 1885 was at least 500 million. He served the St. Louis Company ably and faithfully; and it goes without saying that a similar verdict will in due time be recorded in regard to his Washington experience. The following item may throw a little further light on the man.

PRESENTED WITH A HANDSOME TESTIMONIAL.—The St. Louis (Mo.) *Republican*, of date of October 10, contained the following: "Mr. Thomas G. Lansden, Engineer and Inspector of the St. Louis Gas Light Company, was presented yesterday afternoon with a handsome gold watch and chain, by the officers and employees of the Company, at the gas works station on Convent street. The occasion of the presentation was the severance of Mr. Lansden's connection with the Company, he having accepted an offer to take the position of Superintendent of the Washington (D. C.) gas works. Michael Carroll, foreman of the station where Mr. Lansden spent most of his time, made the presentation in a brief but neat and appropriate speech, to which Mr. Lansden responded with considerable feeling. The watch is beautiful in design, and appropriately inscribed on one side, while the other bears an engraving of a gasholder. The inner case bore the presentation inscription, and the chain—an elegant sample of link work—bore a costly Knight Templar's charm. Mr. Lansden has been in the gas business for 30 years, and has spent many years of that time in St. Louis. He is considered one of the ablest as well as one of the most genial gentlemen in the profession, and his departure from St. Louis will be a cause of regret not only to the St. Louis Company but also to a large host of friends who have learned to appreciate his merit and many good qualities."

TO TAKE CHARGE AT PINE BLUFF, ARK.—Mr. Geo. M. McConaughey has been appointed manager of the Pine Bluff Gas Company, and assumed charge thereof on or about October first. Mr. McConaughey may be counted on to do good work in his new position.

MR. MAHER RESPONDS.—Our item columns, issue of September 16th, contained mention of what was being done by Mr. N. L. Maher, at the Butte City, Montana, gas works. The aforesaid mention included a statement from Supt. Maher that he was carbonizing a variety of coal known as Crested Butte, and mined in Gunnison county, Colorado, which afforded a yield of about 7 cubic feet to the pound. We asked him at the time to furnish us with more detailed information concerning that coal, and are now able, through his courtesy, to state the following in regard to it. The yield will average 6.80 cu. ft. to the pound, with an illuminating value of not far from 16 candles. It is an excellent coke producer, both in the matter of quality and quantity. The absence of "fine stuff" is particularly noticeable, and its value as a furnace fuel is equally pronounced. It does not clinker up the fire boxes, and can always be depended upon to keep up the heats. A gross ton of coal yields 42 bushels of coke, and coke is easily sold at good figures in Butte City. At the mines the coal is delivered on the cars at the rate of $2.50 per ton; yet freight charges are so high that the ton costs just $12.50 when delivered at the Butte City gas works—veritable black diamonds! When the Butte City gas plant commenced operations the local electric lighting company had the advantage of prior possession, and in fact its managers monopolized the artificial illumination of the district. They originally furnished interior lights to 32 stores, but now that total has dwindled to 5, and of that number two are owned by parties who are stockholders in the electric company. Five or six exterior lights comprise the electrician's holding in that direction—save those maintained by the city authorities; but Mr. Maher expects to do the public lighting when the present city contract expires. In the meantime these are "piping times" for the Butte City gas men, who are kept busy putting down new services.

CHEAPER GAS FOR GREEN BAY, WIS.—Mr. Jas. G. Miller, Manager of the Green Bay Gas Light and Fuel Company, has kindly forwarded us particulars regarding the schedule of gas rates made public some time ago, and which took effect on quantities registered from first day of September;

	Gross.	Net.
A monthly consumption less than 1,000 cu. ft.....	$3.00	$2.50 per M.
" " between 1,000 and 4,000 cu. ft...	3.00	2.40 "
" " " 4,000 and 10,000 " ...	3.00	2.20 "

Monthly consumption in excess of 10,000 cu. ft. entitles the user to a special rate. The old gross rate was fixed at $3.50 per thousand, and the discounts ruled about the same as those above given; consequently it may be said the new schedule is equivalent to a reduction of 50 cents per thousand. It might not be out of place to here mention that the Chicago gas stove, which is be-

ing placed on the market by the "Chicago Gas Stove Company," of 69 Lake street, Chicago, is the invention of Mr. Miller.

PURCHASING A GAS WORKS.—When noting Mr. McConaughey's removal to Pine Bluff, Ark., it should have been further explained that the Pine Bluff plant, which had been shut for some time past, has been purchased by Mr. Henry C. Scott, Secretary of the Carondelet Gas Company, of St. Louis, Mo., on account of Mr. Lionberger and a syndicate of St. Louis capitalists. The plant is being thoroughly repaired, and coal gas will be manufactured.

SOLE AGENTS FOR NEW YORK CITY.—Messrs. Wm. Crane & Company, of 89 Liberty street, are the sole agents for the sale, in this city, of the apparatus and fixtures manufactured by the Albo-Carbon Light Company, of Newark, N. J.

A CORRECTION AND SOME FURTHER FACTS FROM HANNIBAL, MO.—In our issue of October 2 reference was made to the way in which the Hannibal taxpayers regarded the cost of the electric lights now doing duty in their city. We expressed the sentiments of the taxpayers properly enough, but failed to present the *Evening Post's* stand in the premises correctly. We are glad, however, that the slight misrepresentation was made, as it now furnishes us with an opportunity to dilate further upon the subject, and in accordance with absolute correctness. A correspondent "out that way," who is ever on the alert, kindly points out our error, and then proceeds to a plain matter of fact statement about the Hannibal electricians, in the following clever style: "In the October 2d issue of the JOURNAL I noticed an item relating to the electric lighting of Hannibal, Mo., which is slightly in error. The statement was made that the *Post* was a strong advocate of electric lighting when the plan was originally broached; and that is a mistake, for the electric fraud was the result of an abortion engineered some months before the sprightly little sheet (the *Post*) was born. That being settled, I can say the Hannibal electric light plant is owned and operated by the city. It is a specimen brick of the style known as the Fort Wayne Jenney system, employing towers which are supposed to be crowned with arc lights rated to the duty of 2,000-candle power each. In reality there is not a single 20-candle power gas burner in the city that does not afford a better light on the street than that given by the average Hannibal arc. The electric system was foisted upon the people by the usual methods. They were told that the net cost to the city, for maintenance, would be about $1,500 per annum, on the basis of an all-night service, as against $3,000 per annum paid to the Gas Company for a service which ended at midnight. With this understanding the people voted to issue $20,000 bonds, to bear 6 per cent. interest, for the purpose of introducing the light of the future. The bonds were sold, the plant was put in, and on June 7 the affair was accepted by the Council. Since that acceptance a doleful attempt has been made to light the city. So far the scheme has resulted in a most signal failure in every respect, as will be understood when it is said that there has scarcely been one night when they have succeeded in supplying light continuously from dark until daylight; for fully one-third of the time there has been no light at all, and on no occasion did they succeed in having one-half of the lights burning at one time. The excuses put forward for this non-performance of duty are numerous and amusing: 'The carbons got wet; the carbon-trimmers expected moonlight and ganged the carbons accordingly; the globes were broken by the storm, and the carbons consume faster when burning in the open air,' etc. Now let us have something about the expense. The cost of maintenance to September 30—four months—as shown by the City Clerk's books, has been $2,545.64, or $636.41 per month, as against $250 per month formerly paid the Gas Company for furnishing a better light, more of it, and lighting a greater number of hours. The figures given make no account of principal or interest on bonds, nor depreciation of plant. Certainly these latter items will amount to from $4,000 to $6,000 per annum additional, a portion of which, during the first year, will probably be recouped from the receipts for private lights fed from the authorities' dynamos." Every statement made by our correspondent in this matter can be implicitly relied upon.

STREET LIGHTING AT COLUMBUS, IND.—When the Columbus (Ind.) Electric Light Company was organized its promoters managed to secure the passage of an ordinance in City Council which granted them an exclusive ten-year privilege. Armed with that document they were prepared to seize the public lighting of the place, but the gas men were in the way. The Columbus Gas Light Company's charter guarantees to it an exclusive privilege to "light the city for 30 years"—the company was organized in 1870. The citizens seemed desirous of having electric light, and did not appear disposed to regard the validity of the "exclusive privilege" owned by the gas company as of much account. Judging them by their actions, Mr. Kellar and his associates went quietly to work, and at the Council meeting held first week in October (when the question of a renewal of the street lighting for coming year was to be discussed) the electricians were surprised—and that is putting it mildly—to find the Columbus Gas Light Company was prepared to light the city either by electricity or in accordance with the former practice. The electricians proposed to do the work, under a schedule of 2,000 hours of burning per annum, for the sum of $2,280 yearly, while the gas company offered to do the same work for $2,200 per annum. The latter also offered to keep up the gas illumination at a charge of $18 per post per annum. The Council finally awarded the contract to the gas company, whose managers will for the next two years light Columbus by means of electricity. The exclusive ten years' clause granted to the electricians was revoked. Perhaps the Columbus gas men might better have allowed the electrical promoters to do the work.

THE KELLER COKE CRUSHER.—The popularity of the Keller coke crusher is plainly shown from the following list of gas companies now using it: Columbus, Ga.; Colorado Springs, Col.; Greenfield, Ohio; Huntsville, Ohio; Chatham, Ont.; Monmouth, Ills.; Milwaukee, Wis.; Nashville, Tenn.; Rockford, Ills.; Springfield, Ohio; Towanda, Pa.; and Vincennes, Ind. The crushers are also used by the Newburgh Orrel Coal Company, of Baltimore, Md., and Messrs. O'Neill & Co., coal dealers, Louisville, Ky.

THE MANCHESTER (N. H.) IMPROVEMENTS ABOUT COMPLETED—Brother Gerould, of the Manchester Gas Light Company, is as progressive as the best of them; and those of the fraternity who find themselves within anything like a reasonable distance of his domain should not fail to improve the opportunity by paying him a visit. The way he utilized that irregular-shaped piece of ground, a portion of which was formerly devoted to coal storage purposes, is well worth seeing—and seeing is believing.

TO BORE FOR NATURAL GAS.—It is said that the proprietors of the Kokomo (Ind.) Gas Light Company will conduct extensive drilling operations in their immediate vicinity for the purpose of finally determining whether or not natural gas can be obtained in sufficient quantities to make its distribution a paying operation.

TO BUILD THE MARSHALL (TEXAS) GAS WORKS.—Rumor has it that Mr. T. G. Macy, of Nantucket, Mass., will build the Marshall gas works, and that he is now *en route* to fulfil that mission.

IT EXPLODED.—Not long since two employees of the Troy (N. Y.) Fuel Gas Company were pretty badly scared at the results of their negligence. They were testing a heater that had been placed in the cellar underneath a barber shop on Third street, and succeeded so completely that the heater was shattered into bits. The "testers" explained that "the explosion was caused by improper ventilation"—*i. e.*, a ventilating pipe instead of being open was closed, because they forgot to open it.

A FEW ELECTRIC SPARKS.—On the evening of October 2d the handsome buildings known as the Borden Block, Fall River, Mass., were fired by electric light wires. Prompt discovery saved the premises. Investigation traced the cause "to bad workmanship in carrying the wires along the woodwork." Oct. 14th, and particularly as to the evening hours, will be long remembered by those living in certain sections of the West. The gale was fast and furious, and the "sparks" were up and doing. Here is mention of what some of them "did." Buffalo, N. Y.—At 8:45 P.M. an electric light wire "cross" fired the Baltimore and Ohio telegraph office. The switchboard and every wire in the office were rendered useless. Erie, Pa., or N. Y.—A terrible gale visited Erie to-night. The electric light works were so badly wrecked that the city is in darkness. Detroit, Mich.—In this neighborhood a gale prevailed all the afternoon. Owing to crossed wires many of the electric lights failed to appear, and a large portion of the city is in darkness. Friday, October 22d, at least in the vicinity of this city, was as beautiful a specimen of an Indian summer day as could be witnessed. Nevertheless, the mellow sunshine and the prevailing calm did not prevent the premises at No. 52 Cedar street from being "struck by lightning" in the shape of a fire caused by a badly insulated electric lighting wire. Between the flames and the firemen the Cedar street landlord is about $4,500 poorer than was the case on October 21st.

BRUNSWICK (GA.) LIGHTED BY GAS.—Some months ago we noted that Messrs. Boardman and Jeter had secured a franchise for the operation of a gas and water company in the town of Brunswick, Ga., and the grantees have not been idle since the parchment came into their possession. The new corporation was formally christened the Brunswick Light and Water Company, and on March 30th, 1886, the work of construction was commenced and prosecuted with that vigor and thoroughness which mark the Boardman plan of procedure. On the evening of October 1st gas was turned into the mains, and shortly afterwards Col. Jeter's little daughter's tiny hand turned on the flow to the burners in the chandelier in the editorial office of the Brunswick *Breeze*, a ready match accentuating the new mode to prevail in lighting up the editorial mind to breezy flights. Under the franchise Brunswick agrees to maintain 75 gas lamps, kept in duty under a moon table, and

to pay therefor the sum of $20 per lamp per annum; also to pay $60 per annum for each public hydrant ordered, and to maintain not less than 25 of these. The mileage of gas conduits already laid totals up to seven, and the length of water conduit now in position is less by one mile. Col. W. A. Jeter is President of the company, and Mr. A. E. Boardman is its Secretary and Treasurer. The works will be superintended by Mr. J. S. Wynne. Now let us hope that the enterprise will receive substantial encouragement from the citizens of Brunswick; and it must be said that the outlook is promising.

The Comparative Cost of Animal and Steam Power.

The London *Jonrnal* says: It has been perceived by many engineers that the substitution of steam for animal power, whether of horses or men, is not always advantageous from an economical standpoint, although at the first glance it may be considered that this substitution should be effected wherever practicable. This question has recently been made the subject of inquiry by a French correspondent of the *Revue Scientifique*, who has, in consequence, arrived at the conclusion that up to certain intelligible limits animal is cheaper than steam power in France, whatever may be the case in other countries. M. Sanson, the writer above alluded to, states that in the conversion of chemical energy into mechanical force the steam motor loses 90 cent., against 68 per cent by the animal. It is also asserted, in contradiction to the general idea, that the energy represented by the unit steam horse-power is often considerably exceeded by the horse itself. The cost of steam power used for traction upon the Mount Parnasse-Bastile tramway, according to M. Sanson, averages 57 frs. per car daily; while the same work done by horses costs only 47 frs. It is to be regretted, however, that M. Sanson did not give his researches a wider basis. There are many purposes for which steam and horse or manual power can be used indifferently; and for some of these mechanical devices of great complexity, and entailing considerable outlay, are devised.

Correspondence

[The JOURNAL is not responsible for the opinions expressed by correspondents.]

The Flow of Natural Gas Through Pipes.

OFFICE NORWALK GAS LIGHT CO.,
NORWALK, OHIO, Oct. 18, 1886.

To the Editor AMERICAN GAS LIGHT JOURNAL:

Your issue of August 16th last* contains an article on "The Flow of Natural Gas Through Pipes." The writer thereof (Mr. E. McMillin), with others, had visited Findlay, Ohio, for the purpose of measuring the flow from the gas wells there, and cites several examples in which pressure gauges were used and calculations made by the common formula

$$Q = 1350 d_2 \sqrt{\frac{h\,d}{S\,(l+d)}}$$

and also gave comparison of cost of pipe lines of 25 and 75 miles in length, both to deliver 24 million cubic feet of gas per day under an initial pressure of 200 pounds per square inch.

Having read the paper, this question occurred to me: "Did the common formula take into account the work done, in a long line of pipe under heavy pressure, by the expansion of the gas?" It was evident that the flow of gas was not constant, for at the well end the velocity would be at a minimum, as there the gas was under the greatest pressure and compressed to many times its atmospheric bulk. We know that in steady motion the same weight of fluid must pass through each cross section in a unit of time.

In looking up various works on this subject I happened upon a formula for determining the flow of air through pipes, over long distances and under heavy pressures, and I believe it to be the correct and only method to be used for calculating the diameter of pipe requisite to convey a given quantity of gas, under given initial and terminal pressures, a given distance. The formula reads:

$$W_0 = \left(1.1319 - 0.7264\frac{p_1}{p_0}\right)\sqrt{\frac{g\ ct\ d}{4\,S\,l}}$$

W_0 = initial velocity in feet per second.
p_1 = end pressure in pounds per square foot.
p_0 = initial pressure in pounds per square foot.

To both the end and initial pressures, as given by a pressure gauge, must be added the atmospheric pressure per square foot.

$g = 32$.
ct = constant, and (for natural gas) specific gravity.
$0.6 = 46{,}000 =$ atmospheric pressure in pounds per square foot $\div$ weight of one cubic foot of gas, in pounds.
l = length of pipe in feet.
d = diameter of pipe in feet.
S = coefficient of friction of gas, which varies from .012 to .005. For a pipe one foot in diameter, and a velocity of 100 feet per second, the coefficient of friction would be .0055.

Later experiments on compressed air show that the coefficient of friction is even less than the above; and a formula for obtaining same is given. Thus:

$$S = 0.0028\left(1 + \frac{3}{10d}\right)$$

in which d = diameter of pipe in feet. For a pipe one foot in diameter, under this formula, the coefficient would be .00364.

$$Q = (1.1319 - 0.7264)\frac{p_1}{p_0}\sqrt{\frac{g\ ct\ d}{4\,S\,l}} \times \frac{p_0}{p_1} \times 2820 d_2$$

in which Q = quantity discharged in cubic feet per hour.

Before meeting with these formulæ, and shortly after having read the article in the JOURNAL of date mentioned, I had occasion to figure on the flow of gas passing through an 8-inch pipe along a distance of 20 miles, the pressure at well being equal to 300 pounds. Calculating by the common formula, I obtained a result showing that in each 24 hours about 3,650,000 cubic feet of gas was discharged into the open air. Now, by this formula, with 300 pounds initial and 1 pound terminal pressure, the discharge will be found to be over 10,500,000 cubic feet per day of 24 hours, or over three times more gas delivered than was shown to have escaped into the open air.

This subject is of great interest to us all, and should be thoroughly discussed. I hope some of your readers will take it up, and, if I am wrong, correct me; if right, the discussion will serve to verify the above.

Respectfully, GEO. H. CHRISTIAN, JR.,
Supt. Norwalk Gas Lt. Co.

*Ante, p. 101, "The Flow of Natural Gas," by E. McMillin.

What the Decision Really Referred to.

MAIN OFFICE ALBO-CARBON LIGHT CO.,
NEWARK, N. J., October 25, 1886.

To the Editor AMERICAN GAS LIGHT JOURNAL:

The notice in your last issue regarding an injunction suit brought against he Crystal Carbon Light Company was incomplete and requires a word of explanation. Most of your readers, being only aware that an application is pending against parties trading as the Crystal Carbon Light Company for an injunction to restrain them for infringing on patents owned by us, will probably understand your notice to refer to the suit for infringement. The persons supplying you the information carefully avoided stating that the injunction there referred to was one to restrain wilful and malicious libel, for which we had promptly applied on the appearance of some letters and circulars, issued under the name of the Crystal Carbon Light Company, and which contained untrue and malicious statements regarding our apparatus and patents. These statements were made by former agents of our Company (Messrs. W. S. Horry and Arthur Kitson, who seem to trade under the designation of the above-named Company), and who have hitherto been loudest in talking up the interest they are now attacking. We applied for an injunction to restrain the defendants from issuing libelous statements concerning the questions appertaining to the infringement suit, during the pendency of that suit. We showed in evidence that many of the statements in these circulars were directly contradicted by the letters and printed statements previously made by the defendant, Mr. Arthur Kitson, when our agent, and that while to the public they had been attacking all of the ten patents under which our apparatus are manufactured, they had just previously been writing to a person who formerly held an interest in these patents, offering to purchase an interest in what is described as "several valuable patents," and asking whether they were for sale to "the highest bidder." The Court denied us the injunction solely on the ground of lack of jurisdiction—Judge Bradley, of the U. S. Supreme Court, in an interesting and elaborate opinion, deciding that Courts of Equity in this country had no jurisdiction to issue injunctions in cases of libel or slander, although such power is now frequently exercised by the English Courts, and that here the injured party must resort to common law actions for damages. I inclose you a verbatim copy of this decision.

In the suit for infringement the defendants have not yet filed their defence, and there is no doubt they will delay doing so until the latest date allowed.

I would take this opportunity of giving publicity to the following notice formerly issued, on his own authority, by Mr. Arthur Kitson, one of the defendants in the above suit, at the time when he was acting as our agent:

"We hereby warn all persons circulating false statements concerning and injurious to the albo-carbon light that we shall take proceedings immediately against them. KITSON & Co."

Yours respectfully,
W. J. KIDD, General Manager.

The Market for Gas Securities.

New York city gas shares were active and strong during the fortnight, Equitable taking the lead by scoring an advance of at least 12 points. At time of writing (noon, Oct. 30) Consolidated is quoted at 83¼; and Equitable is bid for at 119. It is rumored that a "dicker" between the Equitable and Consolidated is in progress, but the assertion may not be in line with truth—although appearances are in favor of it. The Harlem station of he Consolidated (shut down some months ago) is again in duty. City gas shares are a purchase. Higher figures are sure to be made in them. The Brooklyn situation is still mixed, the tendency being downward. The old Brooklyn Company's rate of annual dividend has been reduced to 8 per cent. The last semi-annual, payable from November 1st, being only 4 per cent. Shrewd judges concur in the belief that, even if adverse legislation takes place at Albany, during the next session of the State Legislature, on the matter of enforced gas rates for Brooklyn city companies, Brooklyn gas shares, at present prices—notably Brooklyn and Nassau—are cheap. At auction, 142 shares old Brooklyn, at 106½, ex div., and 360, same, at 105. The out-of-town market is active and strong.

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Rotary Exhauster,
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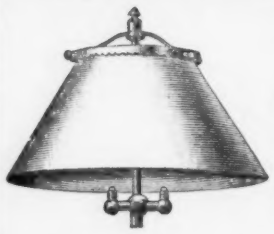

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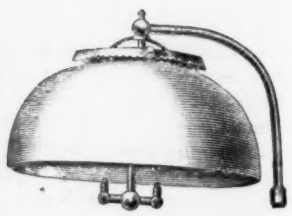

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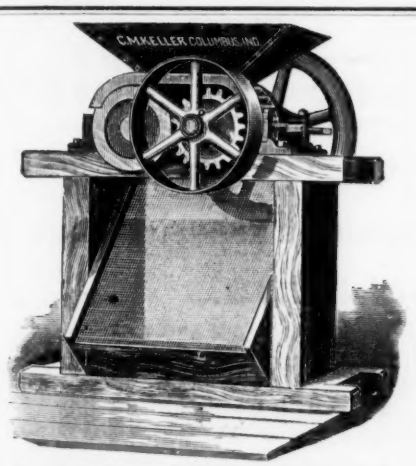

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SIMPLE, STRONG, AND DURABLE.

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GAS COMPANIES, ATTENTION!

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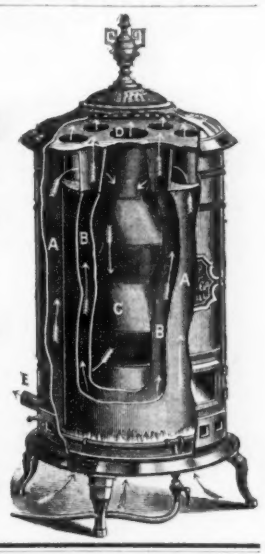

GAS vs. ELECTRIC LIGHT.

We would invite attention to the able and exhaustive argument of General A. Hickenlooper, President of the Cincinnati Gas Light and Coke Company, contained in a handsome pamphlet of 96 pages, entitled

"Edison's Incandescent Electric Lights for Street Illumination. Report of an Argument Delivered by A. Hickenlooper before the Committee on Light, Municipal Council, City of Cincinnati, July 22, 1886."

This is a subject of special interest to all Gas Light Companies.

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Special Designs furnished for Gas Fixtures for Churches, Public Halls, Lodges, etc.

Notice to Gas Companies.

We desire to inform you that letters patent of the United States No. 345,368, applied for on November 21, 1885, were issued to us on July 13, 1886, for an improvement in Automatic Gas Governors, which improvement is set forth in the claim of said patent as follows, viz.:

"The combination of an automatic gas governor so constructed as to automatically increase or diminish the pressure at its outlet in proportion to the volume of gas passing through it, and an adjustable valve so constructed and arranged as to be capable of adjustment to pass different volumes of gas without changing the length of stroke or travel, substantially as and for the purpose specified."

We desire to notify you that we consider that any automatic gas governor having such an adjustable valve is covered by the said patent, and that all automatic governors containing such valves not made by us are infringements of our said patent. We give this notice that all persons may be informed of our claim, so that no one may ignorantly infringe upon our rights.

Very respectfully,

T. E. & J. S. CONNELLY,
Of CONNELLY & CO., LIMITED.

TO ALL WHOM IT MAY CONCERN.

Notice is hereby given that a suit is now pending in the U. S. Circuit Court for the Northern District of Illinois against the Chicago Gas Apparatus Manufacturing Company and Newman A. Ransom, for infringing our rights under Letters Patent of the United States No. 247,925, dated October 4th, 1881, and No. 333,862, dated January 5th, 1886; and that a similar suit for like infringement has been instituted against W. S. Horry (trading as the Crystal Carbon Light Company), Arthur Kitson (trading as Kitson & Co.), and others, in the U. S. Circuit Court for the Eastern District of Pennsylvania. All persons in anywise infringing upon our rights under said Letters Patent will be prosecuted by us upon our obtaining proof of such infringement.

WALTER J. KIDD, General Manager.

THE ALBO-CARBON LIGHT COMPANY, - - NEWARK, N. J.

SOLE MANUFACTURERS FOR THE UNITED STATES.

TRADE MARK.

THE CRYSTAL CARBON LIGHT!

The Latest and Most Improved Gas Light!

ADAPTED FOR PRIVATE RESIDENCES, CHURCHES, THEATERS, STORES, ETC.

These Burners are manufactured on the principle of enriching gas by means of Naphthaline (so-called Crystal Carbon or Albo-Carbon), the invention of the Rev. W. R. Bowditch, F.R.S., of Wakefield, England, who was the original inventor and patentee of this system of gas lighting.

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Many Gas Companies find the Crystal Carbon Light a valuable competitor against the Electric Light. It is ornamental, free from the defects common to all other enriching gas burners, and is as cheap as ordinary gas chandeliers. We sell direct to gas companies, giving them the benefit of agents' discounts.

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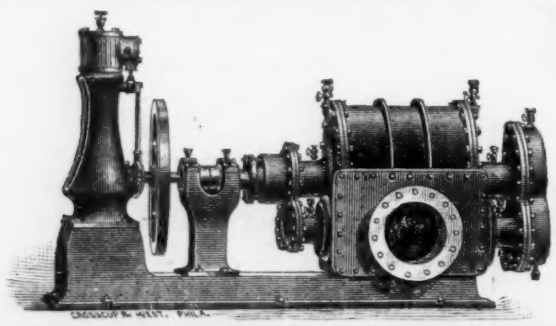

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Elgin Nat'l Watch Company, T. M. Avery, Prest., Chicago.
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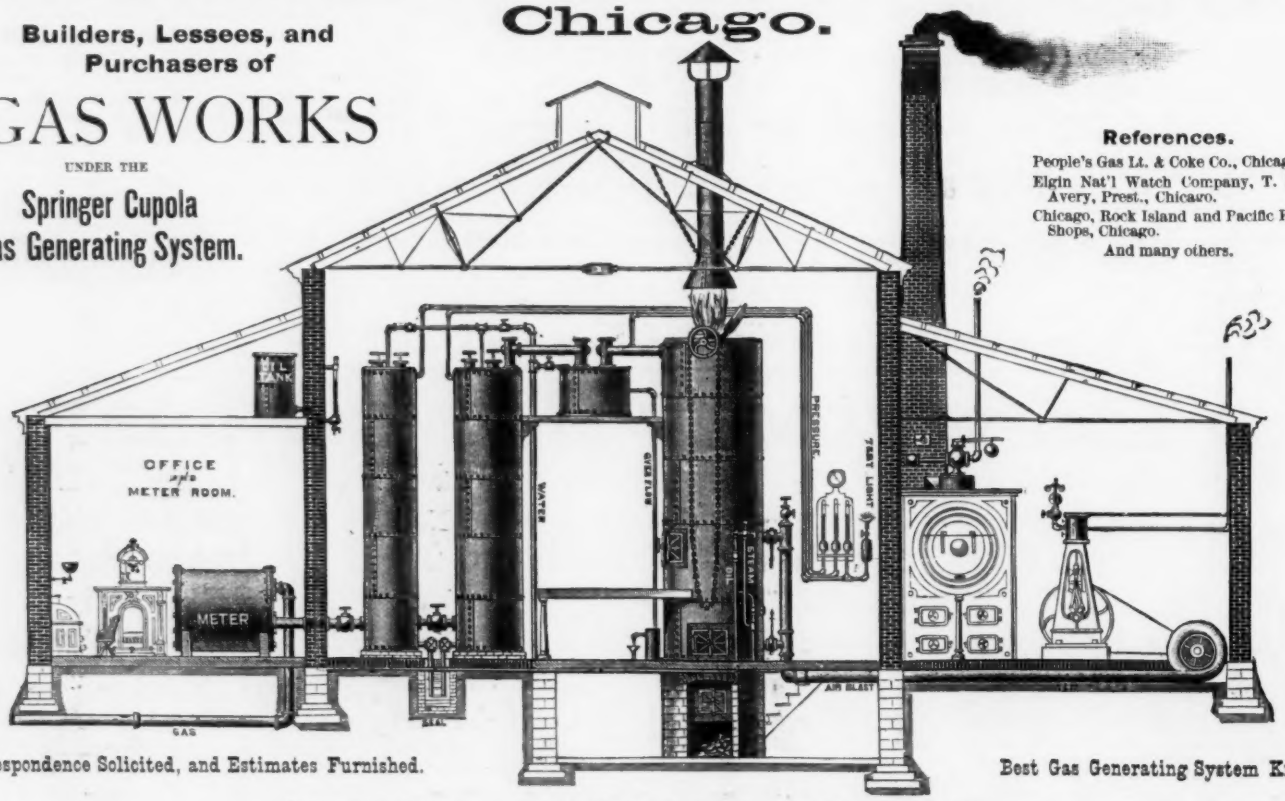

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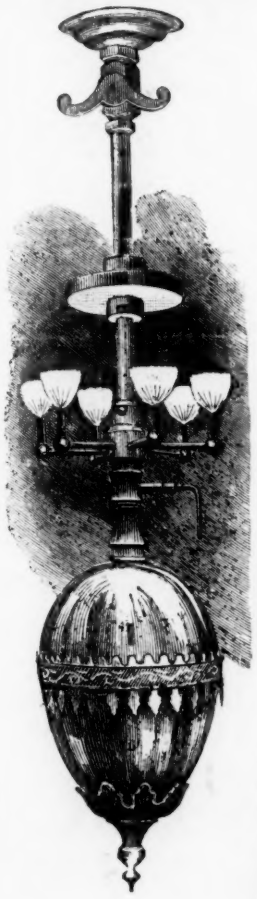

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This most successful of all methods of enriching gas is based on the use of heated gas to vaporize a solid hydrocarbon, thus

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The incoming gas passes over an extended heating surface (heated by means of the illuminating flames), and is raised to the temperature necessary to vaporize the carburetting material, which is a white, crystaline solid prepared from coal tar.

Two Seasons of Practical Use in all parts of the Country have amply demonstrated that the Albo-Carbon Light stands unrivaled for

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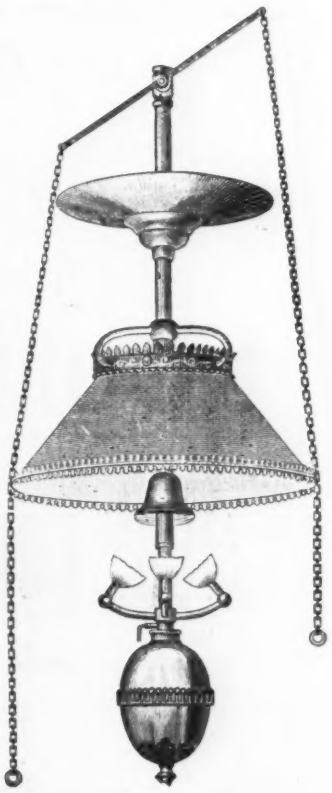
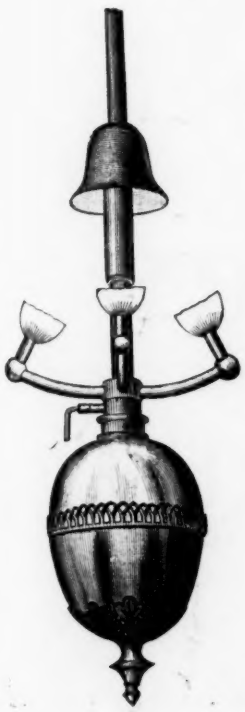
Gas Companies are Finding this System Superior to All Others

in enabling them to meet competition, as its adaptability to various requirements makes it equally as desirable to replace a KEROSENE LAMP, an INCANDESCENT LIGHT, or an ARC LIGHT.

Our Apparatus are made in all Sizes, from 1 to 48 Lights (25 to 1,500 C. P.)

To enable Gas Companies to still more successfully meet this competition and to offer to the public still cheaper forms of our lights, we have added





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NOTICE.

Suits are pending in the U. S. Circuit Courts in Illinois and Pennsylvania against various persons for infringement of our Letters Patent No. 247,925, dated Oct. 4, 1881, and No. 333,862, dated Jan. 5, 1886. All persons are cautioned against manufacturing, selling, or using any apparatus or material which infringes our Patents. We intend to commence suits against all parties infringing Patents owned by us.

The Albo-Carbon Light Co.,

NEWARK, N. J.,

Sole Manufacturers for the United States.

GAS ENGINES. GAS ENGINES. BOOKS.

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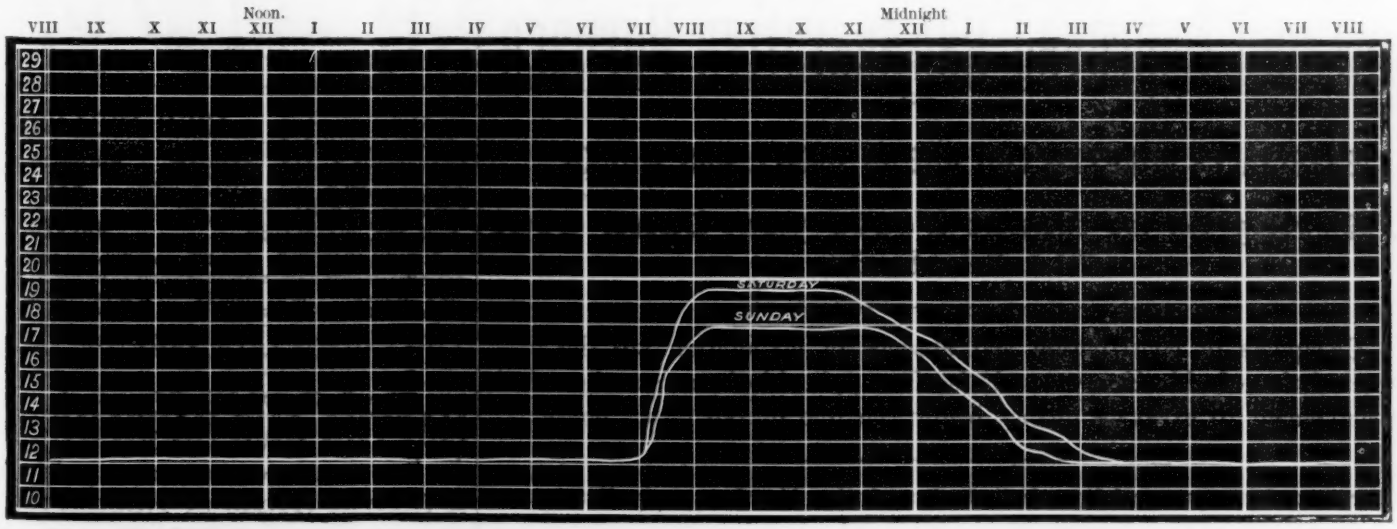
We invite the attention of all practical Gas Managers to the following letter and accompanying cut. The two lines show the pressure held by the Governor on Saturday and Sunday, and clearly illustrates the accuracy of the Governor in *increasing* and *reducing* pressure *in proportion to the volume of gas consumed.*

A Governor that puts the increased pressure on at "one fell swoop" and takes it off in like manner is *not* an "Automatic" Governor; and the circulation of pressure sheets showing such action by a so-called "Automatic" Governor is a rather amusing reflection on the intelligence of Gas Managers.

Strictly speaking, a "Balanced" Governor is an "Automatic" one, as it automatically varies the volume of gas sent out to *maintain a uniform pressure* at its outlet. But, as now applied, the term "Automatic Governor" is understood to mean a Governor that will *maintain pressure between any two desired extremes, in direct proportion to the volume of gas consumed.* Therefore pressure sheets showing *instantaneous changes* from maximum to minimum and *vice versa*, circulated broadcast as the record of an "Automatic (?) Governor," reveals inexcusable ignorance of the subject, amusing to many, yet liable to mislead the inexperienced novice.

We would suggest that all Gas Companies contemplating the placing of *Automatic* Governors would consult their own interests and avoid annoying experience by adopting a Governor *that has a record.*

CONNELLY & CO., LTD., 177 Broadway, N. Y.


VIII IX X XI Noon. XII I II III IV V VI VII VIII IX X XI Midnight XII I II III IV V VI VII VIII
29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10
SATURDAY
SUNDAY

Card Showing Pressure at the Milwaukee Gas Works, Saturday, July 10, and Sunday, July 11 1886.

MILWAUKEE, WIS., August 3d, 1886.

MESSRS. CONNELLY & CO., LTD., 177 Broadway, New York:

Gentlemen—Replying to yours of 29th, I send you a little package of register sheets. When your Governor (20-inch) was set I adjusted it to give 13-tenths day pressure and 22-tenths night pressure. Saturday nights it would run up to 25-tenths. Whenever it would cloud up in the daytime it would go up at first indication of darkness to about 15-tenths. I hunted back in the sheets to find one when pressure was increased in the daytime, but it is so long since we have had a stormy day I could not find one. You can, however, see a *slight change* on sheets for June 1 and June 25. You will see, too, that lately the Governor only puts on *about* 20-*tenths maximum pressure.* This is because *less gas is burned than when it was adjusted.* We have no complaints of pressure, and everyone appears satisfied. In conclusion, can say the Governor has *never been touched* since it was first adjusted, and has at all times *done just the work we wished it to do.* Very truly yours, E. G. COWDERY, Engr. & Supt.

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AUTOMATIC DIFFERENTIAL GAS GOVERNOR

Is now in Practical Operation, doing Perfect Automatic Service with Great Precision.

This Governor will do all and more than any other Governor on the Market.

BE SURE TO THOROUGHLY INVESTIGATE THE SUPERIOR MERITS OF THIS COVERNOR BEFORE PURCHASING.

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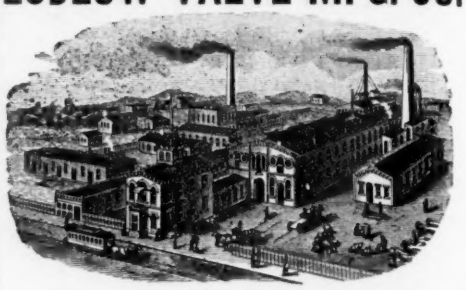

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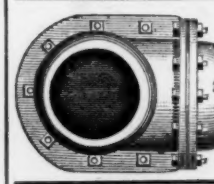

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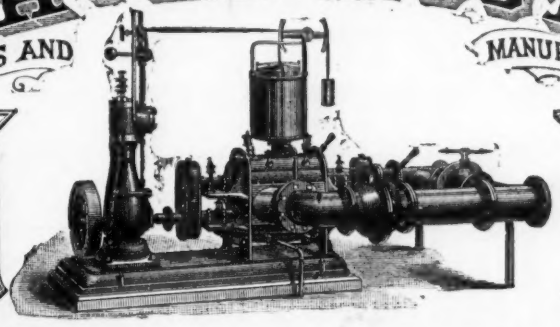

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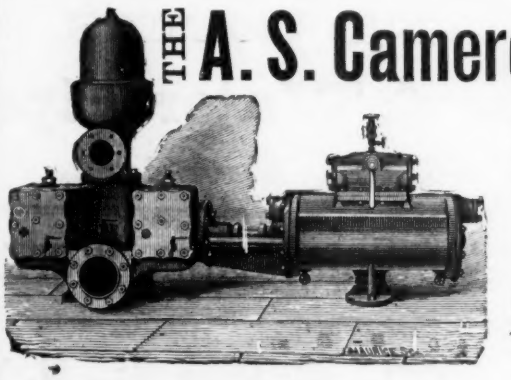

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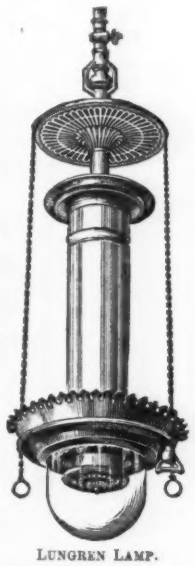

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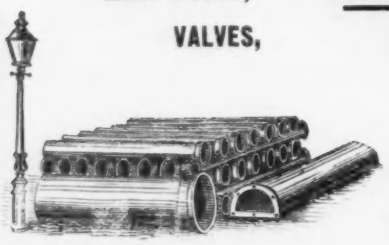

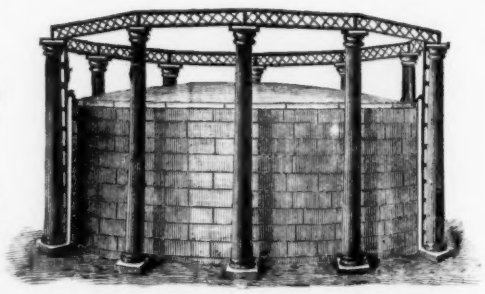

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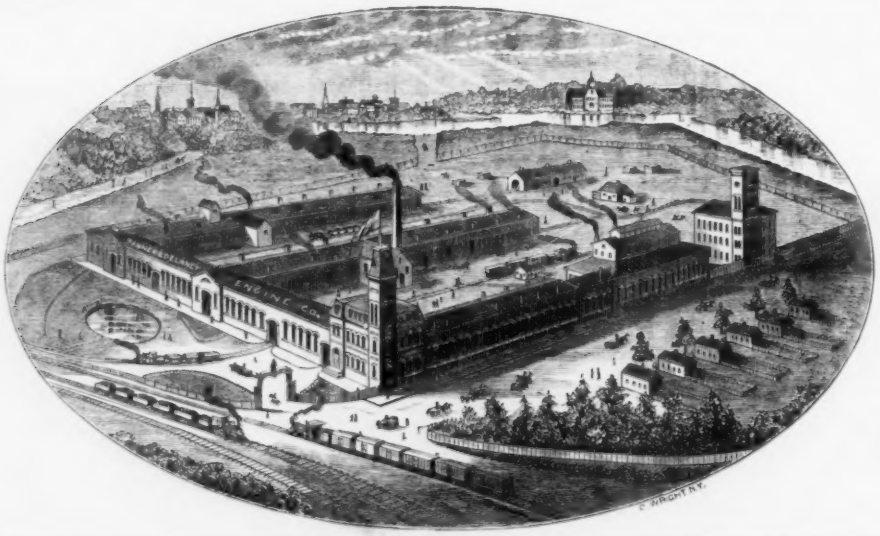

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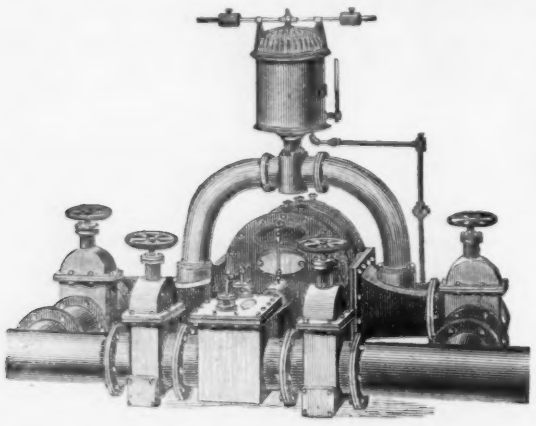

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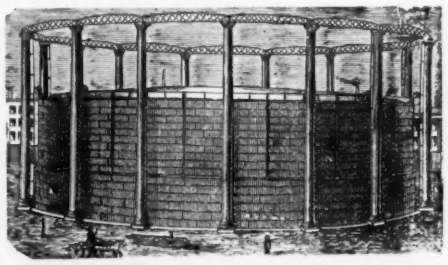

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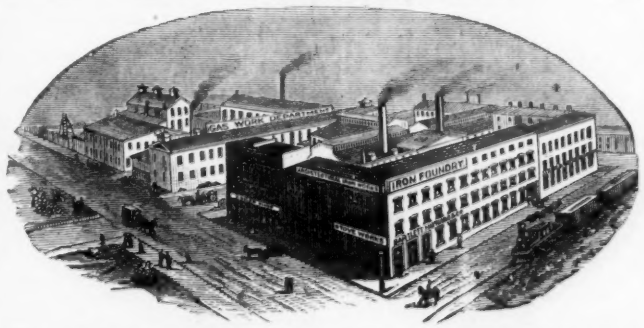

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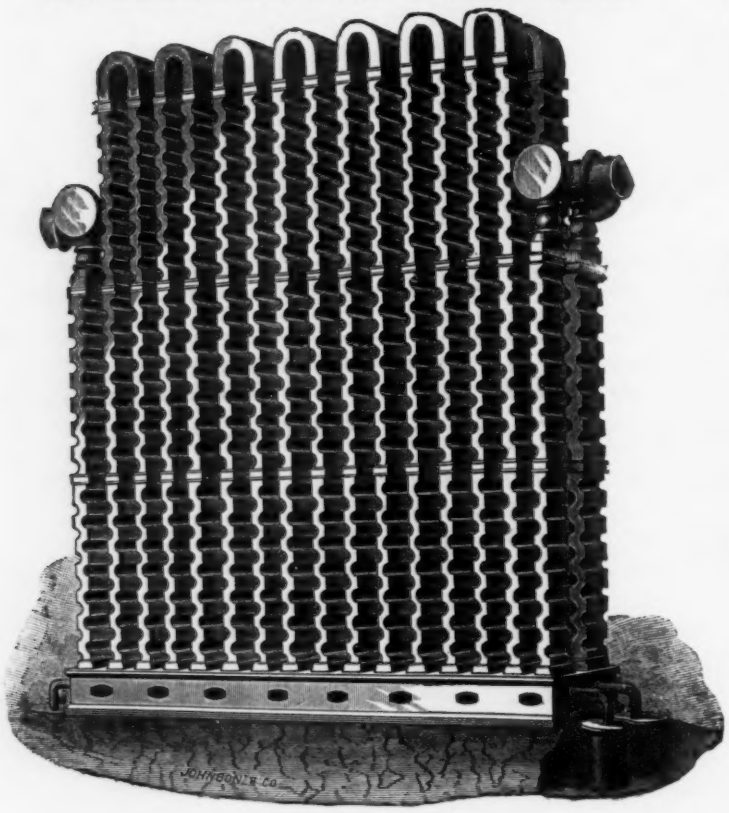

We desire to draw the attention of the gas community to the merits of the SINUOUS FRICTION CONDENSER. Companies intending to introduce new condensers into their works will do well to confer with us and examine plans and estimates before contracting for any other pattern The FRICTION CONDENSER is now in use at the gas works located in the following places:

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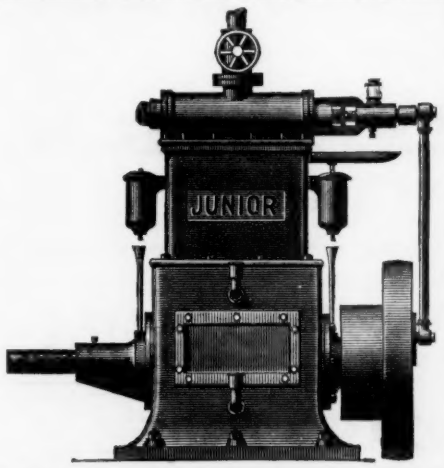

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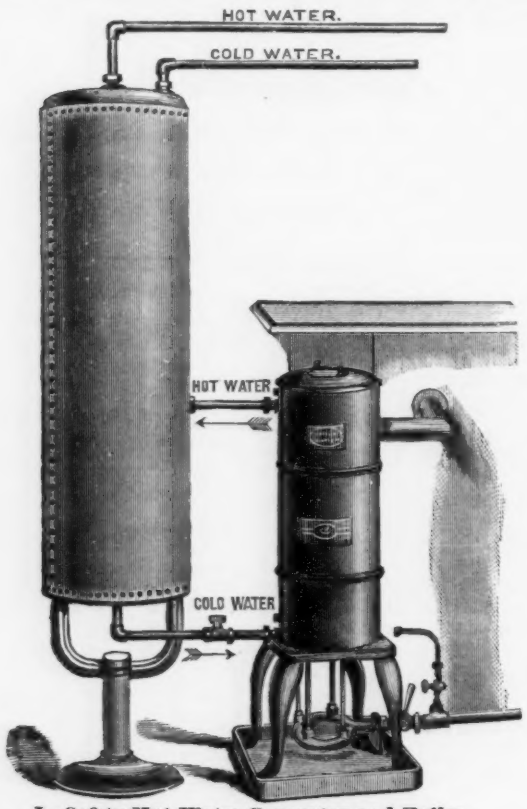

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